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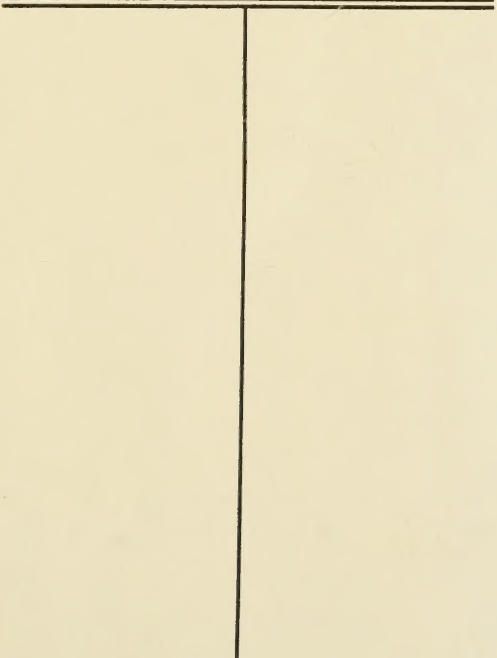
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ATHYRIUM PILIX-FÆMINA.

OUR NATIVE FERNS;

OR A

HISTORY OF THE BRITISH SPECIES AND THEIR VARIETIES.

VOLUME II.

ATHYRIUM.
ASPLENIUM.
SCOLOPENDRIUM.
CETERACH.
LOMARIA.
PTERIS.
ADIANTUM.

CYSTOPTERIS.
WOODSIA.
TRICHOMANES.
HYMENOPHYLLUM.
OSMUNDA.
OPHIOGLOSSUM.
BOTRYCHIUM.

CONTAINING DESCRIPTIONS OF TWENTY-EIGHT SPECIES AND NINE HUNDRED
AND TEN VARIETIES OF BRITISH FERNS.

BY

E. J. LOWE, ESQ., F.R.A.S., F.G.S., F.L.S., F.Z.S., F.M.S.,

Memb. Scottish Meteor. Soc., Hon. Mem. Dublin Nat. Hist. Soc., Memb. Geolog. Soc. Edin.,
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Author of a "Natural History of British and Exotic Ferns," "British Grasses,"
"New and Rare Ferns," "Beautiful Leaved Plants," etc.

WITH FORTY-TWO COLOURED PLATES, AND
FIVE HUNDRED AND NINETY-TWO WOOD ENGRAVINGS.

LONDON:
GROOMBRIDGE AND SONS, 5, PATERNOSTER ROW.

M DCCC LXVII.

LIST OF COLOURED PLATES AND WOOD-CUT ILLUSTRATIONS.

VOL. II.

[The Roman numerals are Coloured Plates.]

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- 278, latifolium
- 279, conioides
- 280, ramo-diffissum
- 281, semidepauperatum
- 282, 283, Monkmanii
- 284, confluens
- 285, subdepauperatum
- 286, acuminatum
- 287, 288, Rutsonii
- 289, plumosum-Monkmanii
- 290, cristato-polydactylum
- 291, polyclados
- 292, multifidum-nanum
- 293, multifidum-Edelsteni
- 294, multifidum-tenue
- 295, multifidum-Mapplebeckii
- 296, multifidum-Coolingii
- 297, multifidum-Fraseri
- 298, excurrens
- 299, 300, ramo-thyssanotum
- 301, macilentum
- 302, marinum
- 303, Courtauldii
- 304, ramulosum
- 305, inciso-digitatum
- 306, alatum-Fraseri
- 307, apuæforme
- 308, Applebyanum
- 309, Arranense
- 310, Barnesii
- 311, 312, bifidum
- 313, Balfourii
- 314, crispatum
- 315, curtum
- 316, contortum
- 317 318, crispum
- 319, coronatum

- 320, crispum-coronatum
- 321, corymbiferum-Loweii
- 322, dareoides
- 323, diffissum
- 324, defectum
- 325, digitale
- 326, 327, denticulatum
- 328, depauperatum
- 329, depauperatum-Edelstenii
- 330, diffisso-multifidum
- 331, 332, dissectum
- 333, dissimile
- 334, elongatum
- 335, 336, Elworthii
- 337, erosum
- 338, eroso-decurrens
- 339, exile
- 340, extremo-digitatum
- 341, flexuosum
- 342, Fieldiæ
- 343, Fieldiæ-pumilum
- 344, fissidens
- 345, Fraserii
- 346, Frizelliæ
- 347, Frizelliæ-nanum
- 348, 349, formosum
- 350, frondosum
- 351, furcillatum
- 352, glomeratum
- 353, Grantiæ
- 354, incisum
- 355, grandidens
- 356, Harrisii
- 357, inciso-multifidum
- 358, impastum
- 359, incompletum
- 360, 361, interruptum
- 362, irregulare
- 363, Iveryanum
- 364, Jamesii
- 365, kalon
- 366, laciniatum-dissectum
- 367, laceratum
- 368, 369, latifolio-confluens
- 370, laciniato-confluens
- 371, laciniato-lineatum
- 372, laciniato-elegans
- 373, laciniato-interruptum

374, *laciniato-truncatum*
 375, *laciniato-Padleyi*
 376, 377, *Laveyanum*
 378, *latum*,
 379, *laxum*,
 380, *Mesembryanthemoides*
 381, *mucronatum*
 382, *multiceps*
 383, *Moorei*
 384, *multicuspe*
 385, *multifurcatum*
 386, *pannosum*
 387, *pannosum-nanum*
 388, *Parsonsiæ*
 389, *parviceps*
 390, *plumosum-Jervisii*
 391, *plumosum-Barnesii*
 392, *plumosum-Stansfieldii*
 393, *plumosum-pruinosum*
 394, *polydactylon*
 395, *purpureum*
 396, *pygmaeum*
 397, 398, and 399, *ramo-depauperatum*
 400, *ramo-cristatum*
 401, *ramosum*
 402, *stenodon*
 403, 404, *subdigitatum*
 405, *suberuciforme*
 406, *tenue*
 407, *trifidum*
 408, *thyssanotum*
 409, *tridentato-multifidum*
 410, *tortile*
 411, *uncum*
 412, *undulatum*
 413, 414, *variabile*
 415, *variabile-Jervisii*
 416, *Vernoniæ*
 417, *Elworthii-splendens*
 418, *Padleyi*
 419, 420, *Willisonii*
 421, *confluens-minor*
 422, *singulare*
 423, *Victoriæ*
 424, *reflexum*
 425, *imbricatum*
 426, *phylloideum*
 427, 428, *laciniato-polymorphum*
 429, *laciniato-laceratum*
 430, *suberosum*
 431, 432, *Edwardii*
 433, 434, *Monense*
 435, *Vernoniæ-cristatum*
 436, *uncum-ramosum*
 437, *tenuifolium*
 438, *abasiphyllum*
 439, *gratum*
 440, *gratissimum*
 441, *truncatum*
 442, *apioides*
 443, *arenosum*,
 444, *rachidioides*
 445, *Craigii*
 446, *Foxtoni*
 447, *brevipinnulum*
 448, *Pritchardii*
 449, *Doodioides*
 450, *plicatum*

451, *delicatissimum*
 452, *Pritchardii-cristatum*
 453, *cornigerum*
 454, *cristulatum*
 455, *Fieldiæ-compositum*
 456, *Fieldiæ-compositum-multifidum*
 457, *Fieldiæ-lanceifolium*
 458, *convexum-multifidum*
 459, *gracile*
 460, *dilaceratum*
 461, 462, *diadematum*
 463, *plumoso-multifidum*,
 464, *stipatum*
 465, *orbiculatum*
 466, *rhaeticum*
 467, *apiculatum*
 468, *acuminatissimum*
 469, *filum*
 470, *coronans*
 471, *remotum*
 472, *eroso-cristatum*
 473, *Scopaeforme*
 474, *fissidente-excurrens*
 475, 476, *caudatum*
 477, 478, *formoso-cristatum*
 479, *latifolium-multifidum*
 480, *sub-plumosum*
 481, *arctum*
 482, 483, *foliaceum*
 484, 485, *corymbifero-strictum*
 486, 487, *multifidum-nanum-angustatum*
 488, *Stansfieldii*
 489, *laciniato-laxum*
 490, *Frizelliae-cristatum*
 491, *incisum-truncatum*
 492, *Fieldiæ-imbricatum*
 493, *pulcherrimum*

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 495, *kalon*
 496, *obtusum*
 497, *caudatum*
 498, *bifidum*
 499, *Kitsoniæ*
 500, *incisum*
 501, *excisum*

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 508, *depauperatum*
 509, *laciniatum*
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515, microdon
516, ramosum
517, obtusatum
518, serratum
519, oxyphyllum
520, grandiceps
521, depauperatum
522, Edwardsii
523, flabellatum
524, variegatum
525, subconfluens
526, incisum
527, 528, intermedium

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XLV. A.—interruptum

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- 529, *portion of*
530, subserratum
531, parallelum
532, sub-bipinnatum
533, lucisum
534, biceratum
535, 536, acutum
537, variabile
538, 539, laxum
540, 541, trapeziforme
542, caudatum
543, imbricatum
544, ramo-trapeziforme
545, 546, Thompsoniae
547, multifido-irregulare

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- 548, incisum
549, ramosum
550, bifurcum
551, katastakton
552, racimosum
553, acrocladon
554, corymbiferum
555, serratum
556, serratum-major
557, incisum-laciniatum
558, lobatum
559, subaequale
560, confluens
561, cristatum
562, multifidum
563, cornuto-ramosum
564, Harovii
565, ramo-depauperatum
566, biceps
567, interruptum
568, crenato-lobatum
569, depauperatum
570, imbricatum
571, incisum-triangular
572, incisum-Claphami
573, ramo-lobatum
574, grandidens

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- 575, multifidum

- 576, 577, deltoideum
578, imbricatum
579, incisum
580, crenatum
581, stipatum
582, ramosum
583, cuneatum
584, varians

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- 585, *dwarf plant*
586, ramo-depauperatum
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588, trifoliatum
589, ramosum
590, cuneatum
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LVI. B.—contractum

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595, submarginato-multifidum
596, crispum-latum
597, papillosum
598, transverso-lobatum
599, periferum
600, acrocladon
601, cornuto-abruptum
602, polycuspe
603, constrictum
604, sagittato-cristatum
605, crenato-multifidum
606, multiforme
607, rugosum
608, irregulare
609, marginatum
610, laceratum
611, subpinnatum
612, subcornutum
613, phyllophyron
614, biceps
615, duplex
616, acanthodes
617, latifolium
618, periergon
619, scalpturatum
620, supralineatum
621, gymnosorum
622, sinuato-multifidum
623, undulato-ramosum
624, 625, undulato-contractum
626, muricato-marginatum
627, undulato-lobatum

- 628, ramusculum
 629, Edwardsii
 630, proliferum
 631, spirale
 632, Elworthii
 633, Lentonense
 634, muricatum
 635, aikmoton
 636, tortuosus-cristatum
 637, ptyoides
 638, crispum-grandidens
 639, divergens
 640, Cliftii
 641, patulum
 642, fimbriatum
 643, variabile
 644, unilaterale-ramosum
 645, marginato-contractum
 646, multifidum
 647, distortum
 648, digitatum
 649, bimarginatum
 650, Marchantioides
 651, turgido-irregulare
 652, stenomenon
 653, fissum-latum
 654, undulatum
 655, turgidum
 656, 657, alatum
 658, marginato-laceratum
 659, fisso-lobatum
 660, transverso-multifidum
 661, flabellatum
 662, cornutum
 663, Balfourii
 664, mutatum
 665, plumoso-lobatum
 666, rotundifolium
 667, multifidum-nanum
 668, marginato-triforme
 669, convolvere
 670, multifido-laceratum
 671, arietinum
 672, Glavei
 673, coriaceo-cristatum
 674, bimarginato-multifidum
 675, marginato-irregulare
 676, supralineato-multifidum
 677, Wardii
 678, dentatum
 679, pseudo-Wardii
 680, Jamesii
 681, fissile
 682, fissile-Monkmanii
 683, 684, circinatum
 685, polyschides-crispum
 686, ramosum
 687, irregulare-minus
 688, brevifolium
 689, Hendersonii
 690, glomeratum
 691, conglomeratum
 692, dareoides
 693, Hookerii
 694, sagittato-polycuspe
 695, variegato-crenatum
 696, undulato-multifidum
 697, marginato-Monkmanii
 698, supralineato-constrictum
 699, erosum
 700, marginato-cordatum
 701, laciniatum
 702, lobatum-ramosum
 703, ramo-proliferum
 704, ramo-palmatum
 705, antrorso-cristatum
 706, Postgateanum
 707, accisum
 708, concavo-ramosum
 709, laceratum-Monkmanii
 710, kephaloton
 711, inversum
 712, subcornuto-laciniatum
 713, hebetatum
 714, cacumene
 715, Lacertum
 716, constellatum
 717, tiariforme
 718, coronare
 719, conjungendum
 720, cornuto-laceratum
 721, latum
 722, sagittatum
 723, grandiceps
 724, glomerato-variabile
 725, muricatum-tenuis
 726, plecomenon
 727, Claphamii
 728, alto-lobatum
 729, Stephanotes
 730, palmatum-marginatum
 731, projectum
 732, polymorphon
 733, undulato-variantes
 734, dactyloton
 735, contorquere
 736, supralineato-cornutum
 737, ramoso-cristatum
 738, variegatum-Elworthii
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 744, Coolingii
 745, sagittato-projectum
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 747, Padleyense
 748, cristatum-Monkmanii
 749, crispum-cristatum
 750, polydactylum
 751, polyschizomenon
 752, Gloverii
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 756, truncatum
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 758, plicatum
 759, supralineato-crispum
 760, lonchophorum
 761, marginato-biforme
 762, pinnatifidum
 763, papilloso-irregulare
 764, corrugato-cristatum
 765, sculpturato-latum
 766, aduncum
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 768, Malcomsoniae
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 772, *congregatum*
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 796, *retusa*
 797, *crispato-imbricata*
 798, *serrata*
 799, *Kitsoniæ*
 800, *ramo-cristata*
 801, *lancifolia*
 802, *cristata*
 803, *multifurcata*
 804, *elegans*
 805, *brevipes*
 806, 807, *projecto-multifida*
 808, *anomala-lineata*
 809, *rotundata*
 810, *caudata*
 811, 812, *duplex*
 813, *Claphamii*
 814, 815, *multifida*
 816, *ramosa-Cliftii*
 817, *attenuata*
 818, *imbricato-erecta*
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OUR NATIVE FERNS.

GENUS VI.

ATHYRIUM. ROTH.

THE present genus of Roth, holding a midway position between *Aspidium* and *Asplenium*, is rejected as a genus by some of our greatest authorities, being united to *Asplenium*. Sir W. Hooker places it in *Asplenium* as a sub-genus, dividing *Asplenium* into the groups *Thamnopteris*, *Euasplenium*, *Athyrium*, *Eudiplazium*, *Anisogonium*, and *Hemidictyum*. Seven species are placed under *Thamnopteris*, and commonly called Bird-nest Ferns, none of which are found in Europe. They are distinguished by a marginal longitudinal vein, with which the apices of the transverse veins unite, and there only. Fronds simple; sori like *Euasplenium*. Two hundred and seven species belong to *Euasplenium*, and are distinguished by the sori being plane or nearly so, nearly always single; veins free, simple, or branched, and the fronds undivided, lobed, or palmated, pinnate or bipinnate. In this large branch are to be found *Asplenium Hemionitis* of Southern Europe, *A. attenuatum* of New Holland, *A. marinum* of Great Britain, *A. lucidum* of New Zealand, *A. angustifolium* of the United States, *A. compressum* of St. Helena, *A. trichomanes* of Great Britain, *A. Petrarchæ* of Southern France, *A. ebeneum* of North America, *A. monanthemum* of Madeira, *A. viride* of England, *A. septentrionale* of Great Britain, *A. Germanicum* of Great Britain, *A. ruta-muraria* of Great Britain, *A. fissum* of Southern Europe, *A. adiantum-nigrum* of England, *A. lanceolatum* of England, and *A. fontanum* of England.

Twenty-nine species belong to *Athyrium*, which are distinguished by short sori, and lax, convex, or arcuate involucre, and with pinnato-pinnatifid or bi-tripinnate fronds. Amongst these are *Asplenium filix-femina* of Great Britain, *A. crenatum* of Norway, and *A. thelypteroides* of North America.

Fifty-one species belong to *Eudiplazium*, having double involucre; none of which are European. Seven species belong to *Anisogonium*, having anastomosing veins; none of which are European. Four species belong to *Hemidictyum*, having sori very long, naked, asplenoid, with veins anastomosing towards the margin. In this group Sir W. Hooker places *Asplenium ceterach* of England, (the *Ceterach officinarum* of Willdenow, or *Grammitis ceterach* of Swartz.)

Although I quite agree with Sir W. Hooker in the dubious distinctness of the genus *Athyrium* from *Asplenium*, still as Mr. Moore retains the genus we shall keep the Lady Fern distinct from the other *Aspleniums*.

Athyrium has short, oblong-lunate, curved, or horse-shoe-shaped indusiate sori; veins simple or forked from a central costa: venules free. Caudex brief, erect, or creeping. Fronds herbaceous, bi-tripinnate.

Only one species inhabits Great Britain.



Fig. 276.—Portion of mature Frond, under side.

ATHYRIUM FILIX-FÆMINA.

ROTH.

The Lady Fern.

PLATE XXXV.

<i>Athyrium filix-femina</i> ,	ROTH. PRESL. FEE. BABINGTON.
“ “	SOWERBY. NEWMAN. MOORE.
“ <i>ovatum</i> ,	ROTH. (<i>Not</i> NEWMAN.)
“ <i>molle</i> ,	ROTH. NEWMAN.
“ <i>trifidum</i> ,	ROTH.
“ <i>laxum</i> ,	SCHUMACHER.
“ <i>lætum</i> ,	GRAY.
“ <i>depauperatum</i> ,	SCHUMACHER.
“ <i>acrostichoideum</i> ,	BORY.
<i>Asplenium filix-femina</i> ,	BERNHARDI. SPRENGEL. R. BROWN.
“ “	FRIES. LEDEBOUR. KOCH.
“ “	HOOKE AND ARNOTT. BENTHAM.
“ “	MACKAY. DEAKIN. GRAY.
“ “	METTENIUS. MILDE. E. J. LOWE.
“ <i>intermedium</i> ,	LINK.
<i>Aspidium filix-femina</i> ,	SWARTZ. SCHUHR.
“ “	WEBER AND MOHR. WILLDENOW.
“ “	SMITH. TENORE. NYMAN.

<i>Cyathea filix-fæmina,</i>	BERTOLONI.
<i>Cystopteris filix-fæmina,</i>	COSSON AND GERMAIN.
<i>Tectaria filix-fæmina,</i>	CAVANILLES.
<i>Nephrodium filix-fæmina,</i>	STREMPER.
<i>Polypodium filix-fæmina,</i>	LINNÆUS. BOLTON. HOFFMANN.
“ “	POIRET. HUDSON. WEIS.
“ <i>dentatum,</i>	HOFFMANN.
“ <i>oblongo-dentatum,</i>	HOFFMANN.
“ <i>ovato-crenatum,</i>	HOFFMANN.
“ <i>bifidum,</i>	HOFFMANN.
“ <i>trifidum,</i>	HOFFMANN.
“ <i>molle,</i>	SCHREBER. HOFFMANN. POIRET.
“ <i>lætum,</i>	SALISBURY.
“ <i>revolutum,</i>	BORY.
“ <i>Leseblui,</i>	MÉRAT.

Athyrium—From the Greek, *athyros*—opened. *Filix-fæmina*—Lady Fern.

CAUDEX thick, occasionally with a trunk-like scaly crown.

Scales nearly black in colour, and more or less lanceolate in form.

Venation circinate, the apex at one period of its development curved downwards similar to a shepherd's crook.

Stipes from a third to a fourth of the length of the entire frond, terminal, stout, and thickened immediately above the base, green in some varieties, and pinky purple in others. Thickly scaly at the base.

Rachis rounded behind and channeled in front, having a few narrow scales.

Fronds herbaceous, erect, spreading, or drooping, vivid green in colour, varying much in size and outline; length from twelve inches to forty inches, breadth from three inches to fourteen inches.

Lanceolate in form, bipinnate or sub-bipinnate.

Pinnæ pinnate, numerous, broadest at the base, and gradually tapering to a point.

Pinnules various. Veins forked or pinnately branched.

Fructification covering the whole under surface of the frond.

Sori numerous, short, medial, and indusiate.

Indusium membranaceous and variable in outline, taking the forms of the sori.

The fronds spring up in May, and decay in early autumn.

Athyrium filix-fœmina is a common species throughout Great Britain, growing most luxuriantly in damp, shady situations. In mountainous exposed situations it becomes dwarf and more rigid. Scott remarked this when he wrote:—

“Where the copse-wood is the greenest,
Where the fountain is the sheenest,
Where the morning dew lies longest,
There the Lady Fern grows strougest.”

The Lady Fern is to be found at every elevation up to three thousand feet. The localities are too numerous to mention.

Abroad it is a native of Lapland, Russia, Holland, France, Scandinavia, Belgium, Germany, Switzerland, Croatia, Hungary, Spain, Portugal, Italy, Transylvania, Greece, Crete, Caucasus and Ural Mountains, Russian Asia, Siberia, India, Mediterranean Islands, Algeria, Islands of Canary, Madeira, and Teneriffe, throughout North America, Canada, British Columbia, United States, Vera Cruz, Caraccas, Bolivia, and Cuba.

This species is readily cultivated both in the out-door Fernery and in pots, and is one of the finest of Ferns, in fact the Queen of Ferns, some of its varieties being most beautiful. There are many striking varieties, all of which are graceful, and worthy a place in every Fernery, these are:—



Fig. 277.—Portion of Frond.

OXYDENS, *Moore*. (Fig. 277.)—A beautiful variety, remarkably frondose, or leafy, and having a very spreading habit. It is hardly of the robust form. Fronds twelve to eighteen inches long, narrow lanceolate, profusely fertile. Pinnæ shortened, and towards the apex (owing to a crispy contraction of

the midrib, not common to all fronds) sometimes much crowded upon the rachis, indeed decidedly imbricate. The pinnules are thickly set upon the secondary rachides, and are both confluent and imbricate, but scarcely depauperate, although sometimes furcate. The variety is scarcely bipinnate, but the pinnules are deeply incised, or erose, giving to the plant a distinctly toothed character, which, doubtless, suggested Mr. Moore's name. This plant is very rare, and somewhat strange to say, although so decided a sport has not hitherto been found to reproduce itself (in the discoverer's fernery at least) from the spores. The variety was found by Mrs. C. Monkman, of Malton, in the summer of 1861, in crossing the mountains from Elleray to the Troutbeck Valley, in the Windermere district, and it has rather improved than otherwise in cultivation. From the reason given above this variety has only been "multiplied by division," and plants are only held by Mr. Monkman, Mr. Clowes, Mr. Clapham, and Messrs. Stansfield. The illustration is from the original plant found by Mrs. Monkman.



Fig. 278.

LATIFOLIUM, Babington. (Fig. 278.)—A very handsome vigorous-growing variety, found near Keswick, Cumberland, by Miss Wright. Although only one or two plants were discovered, owing to its being reproduced by spores, it has now become widely spread in our Ferneries. A peculiar-looking variety, it is remarkable for the irregular outline of the pinnæ, for the peculiar position of the sori; and for the pinnules being densely crowded together, very various in size, and uneven in toothing. Length of frond upwards of three feet; colour dark green. Bipinnate, oblong-lanceolate, and flaccid. Rachis and stipes strong and thick, and of about the usual length. Pinnæ brief,

wide apart below, and crowded together towards the apex of the frond. Alternate and linear oblong. Pinnules usually oblong-ovate, overlapping, flat, oblique, the anterior side the longest. The peculiar toothed margin gives the frond a fimbriated appearance. Sori situated on the anterior side of the basal anterior venule; however the vein becoming branched at a greater distance from a midvein than is ordinarily the case, the sori become placed half-way between the margin and the midvein in two distinct lines. Sori small and curved. My thanks are due to Sir Oswald Mosley, Bart., of Rolleston Hall; Mr. E. Cooling, of Derby; and to Mr. R. Sim, of Foot's Cray, for plants.



Fig. 279.—Portion of Frond.

CONIOIDES, *Appleby*. (Fig. 279.)—Found at Cantley, near Doncaster, by Mr. S. Appleby. Length of frond two feet. Stipites pale in colour, and furnished with light brown scales. Fronds broadly lanceolate. It takes its name from a resemblance to the hemlock leaves in the outline and divisions of the fronds. Pinnæ irregular in outline, somewhat distant and acuminate. Pinnules mostly ovate, occasionally oblong, decurrent at the base, varying in size and outline, distant. Lobes distant and shallow, and notched almost to the apex, and these again notched with brief minute teeth. In the fertile fronds the pinnules taper to an acute point, and the lobes are narrower and more distant. Sori situated near the base of the lobes. It is not uncommon to observe forked or ramose pinnules. My thanks are due to Mr. Swynfen Jervis, of Darleston Hall;

Mr. E. Cooling, of Derby; Mr. Sim, of Foot's Cray; to Mr. Stansfield, of Todmorden; and to Mr. Kennedy, of Covent Garden, for fronds.



Fig. 280.—Portion of Frond.

RAMO-DIFFISSUM, *Monkman*. (Fig. 280.)—Fronds usually ramose or trifold, lanceolate. Pinnæ as in *diffisum*, the lower pair, or one of them, frequently forming a diminutive frond. Sometimes the fronds are of the normal outline, except that the lower pair of pinnæ, by forming dwarf frond-like elongations, give them a sagittate feature. Of a spreading habit, with all the delicacy of *diffisum* or *dissectum*, and the peculiarly wide and irregular tothing of those varieties. The plant is very beautiful, and was raised in the fernery of Mr. C. Monkman, of Malton, who sends the fronds. Mr. Monkman has sown spores more than once, but has never succeeded in raising a ramose seedling, the young plants having all reverted to *diffisum* or *dissectum*, although the plant is very constant to the ramose character, a frond of purely normal outline being the exception. The illustration is from Mr. Monkman's plant.

ALATUM, *Moore*.—This variety was first found on Loch-na-gar about seven years ago, growing amongst *Polypodium alpestre*. The plant is in the possession of Mr. A. Tait, of Edinburgh. A delicate-fronded variety, dwarf, and drooping in habit, much

more confluent than the variety *marinum*, which it somewhat resembles. Lanceolate in form, with the lower pinnæ small and deflexed; the pinnæ have a broad base, and a blunt rounded apex; pinnatifid almost to the rachis at the base, above which more confluent, the pinnules being connected with the rachis by a broad distinct wing. Pinnules overlapping; as broad above as below, their apices rounded, and the margins notched with well-marked acute teeth. Sori short, and confined to the lowest veins in each segment. An illustration is not needed.

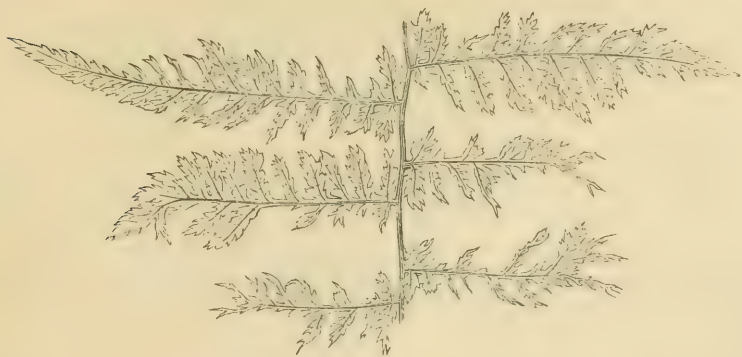


Fig. 281.—Portion of Frond.

SEMIDEPAUPERATUM, *Clapham*. (Fig. 281).—An erect-growing form, the apices of the fronds gracefully arching, the whole forming a fine convolvulus-shaped plant. Fronds of the outline of *marinum*, the fronds and pinnæ making very long attenuated apices, all of which, together with the pinnules, are semidepauperated, or deeply cleft into somewhat regular sinuses, giving to the plant a very elegant, in addition to its extremely graceful, appearance. It is truthfully constant, and profusely fertile. Probably one of the prettiest of the long-striped nonfrondose varieties. The plant is in possession of Mr. C. Monkman, of Malton, who supplies the fronds for illustration.

POLYCLADOS-DISSECTUM, *Moore*.—Found in Trentham Park, Staffordshire, by Mr. Swynfen Jervis, of Darlaston Hall, near Stone. Fronds usually ramose; the stipites and rachides red

in colour, the pinnæ occasionally forked at their extreme apices; the pinnules sessile or decurrent, pinnatifid, the teeth on the lobes being deep, linear, acute, and irregular. No illustration is necessary.



Fig. 282.—Apex of Frond. 283.—Middle pinna.

MONKMANII, Moore. (Figs. 282 and 283.)—A crested form of irregular habit. The fronds are normal in outline, having the pinnæ rather distant, and the pinnules broad, incised, and much crowded, sub-imbricate. The fronds are all crested, but not with any degree of regularity, some being massive, as in *coronans*, others as in *multifidum*, with an occasional multi-furcate apex. The pinnæ are generally crested, but vary in size and regularity. The plant is very handsome, erect in habit, and peculiarly frondose in the pinnæ. This variety was found by Mr. Monkman, in 1860, growing on a bank near a well in Troutbeck

village, where hundreds of persons must have passed it daily, at least in the summer-time, in going to or returning from Ambleside. The plant, when found by Mr. Monkman, was double crowned, and was divided with Mr. Clowes, the variety yet remaining exclusively in possession of these growers. Mr. Monkman sends the frond for illustration.

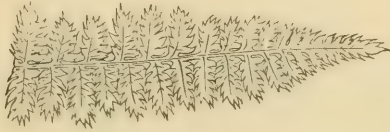


Fig. 284.

CONFLUENS, *Moore*. (Fig. 284.)—Height twelve inches. Habit erect. Rigid. Sub-bipinnate, form narrow-lanceolate. Pinnæ distant and irregular in outline. Basal anterior pinnules stipitate, ovate, profoundly pinnatifid, segments having a few coarse sharp teeth, the remaining pinnules similar but smaller. Sori irregular. Found by Mr. A. Tait, of Edinburgh, in 1853, in the seam of a perpendicular rock on the pine-covered mountains near Dunkeld. For plants and fronds I am indebted to Mr. Swynfen Jervis, of Darleston Hall; Mr. C. Elworthy, of Nettlecombe; Mr. E. Cooling, of Derby; and Mr. Kennedy, of Covent Garden.



Fig. 285.

SUBDEPAUPERATUM, *Clowes*. (Fig. 285.)—A large-growing variety, apparently of the *decompositum* type, found by Mr. F. Clowes, at Windermere. Its peculiarity consists in the pinnæ being occasionally denuded of their pinnules, of which only the midribs perhaps are represented; and in some cases

the pinnae themselves are either totally wanting, or have merely their midribs present. The variety grows well in Mr. Clowes' out-door Fernery at Windermere, and is quite constant to its odd-looking peculiarities. The illustration is from a division of the original plant, forwarded by Mr. C. Monkman. The variety is more curious than pretty.



Fig. 286.

ACUMINATUM, *Moore*. (Fig. 286.)—Found some years ago on Snowdon by Mr. W. Pamplin. This interesting and singular variety is of dwarf habit. The fronds, which are broadly lanceolate, are somewhat more than twelve inches in length. The pinnae are crowded, brief, deflexed below, the longest pinnae terminating in a serrated acuminate point. The pinnules distinct, but decurrent, linear-oblong in form, blunt at the apex, and frequently narrowed below, numerous, patent, (*i. e.* spreading at an angle of 45°), pinnatifid in the basal part. The dentation of the pinnules and lobes also long and acute. Sori in lines near the costa, and abundant. The chief peculiarity of this slender and graceful variety consists in its acuminate pinnae, and narrow oblong pinnules.

POLYCLADOS-IRREGULARE, *Moore*.—Found by Mr. G. B. Wolleston, of Chiselhurst, in Pett's Wood, near Chiselhurst, Kent, and at Hulm, near Windermere. Fronds frequently branched, and multifid at the apex; the apices also of the irregular confused-looking pinnae frequently forked. Pinnules irregular both in size and form, sometimes ovate and profoundly pinnatifid, occasionally linear, with narrow lobes, or distorted, or abbreviated. Dentation not prominent, brief, and acute. It is not necessary to give an illustration.



Fig. 287.—Shewing form of Frond. 288.—Pinna.

RUTSONII, *Monkman*. (Figs. 287 and 288.)—Fronds broadly, almost triangularly lanceolate, spreading. This is a remarkable form. The lower pairs of pinnæ are longest, and mostly or nearly normal. In ascending order they become ramose or dichotomously forked, frequently forming flabellate fan-like pinnæ. Towards the apex of each frond the pinnæ become cruciate, as in the

whole frond of *Fieldiæ*, and imbricate; indeed from the very nature of the ramose pinnæ the imbricate character is strongly marked throughout. The apices of the frond are more or less flattish-forked or branched, but where not so are attenuated or caudate, much resembling in the upper parts the variety *Fieldiæ*. The plant is profusely fertile, and is a vigorous grower. The history of this remarkable variety is obscure. The plant illustrated was purchased at the Yorkshire Gala, 1863, for Mr. C. Monkman, of Malton. The exhibitor knew little of it, except that it had been found by a Mr. Rutson, somewhere about the Hambleton range of hills, in North Yorkshire. Mr. Monkman furnishes the fronds for illustration.



Fig. 289.

PLUMOSUM-MONKMANII, *Stansfield*. (Fig. 289.)—This elegant variety was found by Mr. C. Monkman, when botanizing in company with Mr. T. Stansfield, in Coneysthorpe banks, Castle Howard, Yorkshire, in 1862. Four crowns were found, which are held by the discoverer, Messrs. Stansfield, the Yorkshire Philosophical Society, and Mr. Clapham. The form is recognisable as a plumose variety at first glance, but on examination does not prove so finely divided as the *plumosum* of the Messrs. Stansfield, from which also it differs in its erect, stiff habit of growth, and rigid pinnæ. The Messrs. Stansfield's form of *plumosum* is certainly the more graceful of the two. So far Mr. Monkman's variety has proved barren. The illustration is from one of the original plants, sent by Mr. Monkman.

CRISTATUM, *Monkman*.—This form is distinguished by its crested apices of fronds, the pinnæ shewing no such peculiarity. It was found by Mr. C. Monkman in Slingsby Woods, near

Malton, and subsequently by Mr. John Muckle, of Norton, near Hovingham. No illustration is requisite, indeed both the plants alluded to are dead.



Fig. 290.—Apex.

CRISTATA-POLYDACTYLA, *Stansfield*. (Fig. 290.)—A splendid variety sent out by Messrs. Stansfield, of Todmorden. It may be described as an improved form of *multifidum*. The difference consists in its erect habit of growth, and generally robust character. The fronds are short, and the apices of the fronds and pinnæ all end in a massive crown-like crest, rendering the plant very distinct botanically, and in appearance from *multifidum*. The illustration is from Mr. Monkman's plant, who says the variety is identical with a crested form now offered by Messrs. Stansfield, as *multifidum-nanum*.

MULTIFIDUM-NANUM, *Stansfield*.—See *Cristata-polydactyla*.

POLYCLADOS-MINUS, *Moore*.—Found near Scarborough by Mr. Clapham. This subvariety is ramose both in the stipites and rachides. The pinnules being small, blunt, and oblong in form, which are normal as regards being pinnatifid and toothed. An illustration is not needed.



Fig. 291.—Upper pinna

POLYCLADOS, *Moore*. (Fig. 291.)—A curious variety. Large spreading fronds, usually twin- or ramo-fronded, or furcate; the primary divisions more or less irregularly forked, but without any tendency to cresting. Some fronds are not ramose, but have a peculiar warty contraction of the midrib about midfrond, which causes the pinnæ to crowd into masses on either side. The plant is a curiosity, with no two fronds exactly alike, and many as divergent as possible. Found near Ilfracombe, Devonshire, by the Rev. J. M. Chanter; in Guernsey by Mr. C. Jackson; Ecclestone, in Lancashire, by Mr. R. Morris; near Manchester by Mr. J. Horsfall; Barnstaple, Devonshire, by Mr. C. Jackson; and at Windermere by Mr. F. Clowes. There are several sub-varieties hereafter to be described. The illustration is from Mr. Monkman's plant.

FURCANS-MONKMANII, *Monkman*.—Of this variety several plants were found in the immediate neighbourhood of *Monkmanii*. It is a robust grower, and is in all respects analagous



to the varieties so named in *Lastrea* species, with the peculiar sub-imbricate pinnules of *Monkmanii*. The apices of fronds and pinnæ are bifid or trifid, rarely approaching a crest. Mr. Monkman visited the station in Troutbeck, in 1863, and found two more plants. An illustration is not needed.

MULTIFIDUM, Moore. (Plate XXXVI.)—A most beautiful, symmetrical, and graceful Fern, although a monstrosity. It was originally found in Ireland, near Seven Churches, County Wicklow, by Mr. D. Moore, of the Glasnevin Gardens, Dublin; other very similar forms have since been found in County Clare by the late Dr. Kinahan; in Killarney by Mr. Ogilby; in the lake district of Westmoreland, now in the possession of Mr. G. B. Wollaston; and in Scotland at the base of Ben Lawers by Mr. W. Marshall, of York. This variety is analogous to the cristate variety of *Lastrea filix-mas*. The fronds are two to three feet in length, and nine or ten inches in width. Normal in habit, broadly lanceolate, and somewhat lax. The characteristic difference of this variety consists in the apices of the fronds, and also of the pinnæ and pinnules being beautifully tasseled, or divided into dichotomously branched narrow segments. In the many times dichotomously branched apices of the pinnules the tips of the segments are spread out and incised. The pinnules are oblong-acute, subfalcate, pinnatifid, the points of the lobes recurving, as in the variety *rhæticum*, and thus in some degree detracting from the beauty of the fronds, giving them a curled appearance, although the beauty is not marred to any great extent. My thanks are due to Mr. Sim, of Foot's Cray; Mr. Monkman, of Malton; to Mr. Kennedy, of Covent Garden; to Mr. E. Cooling, of Derby; and to Mr. Veitch, of the Exotic Nurseries, Chelsea, for plants; and to the same gentlemen, and to Mr. G. B. Wollaston, of Chiselhurst, for fronds.

MULTIFIDUM-RAMOSUM, Moore.—Raised from spores by Mr. Clapham, of Scarborough. Fronds broad and short, they are more lax and slender than in the ordinary form of *multifidum*, the pinnæ being often unequally branched. Pinnules also narrower, and somewhat depauperated, and their apices more raggedly multifid. Mr. Moore remarks that the fronds

have a ragged and semi-depauperated appearance. No illustration is necessary.



Fig. 292.—Pinna.

MULTIFIDUM-NANUM, *Moore*. (Fig. 292.)—A dwarf, more lax, and narrower-pinnuled variety than *multifidum-Edelstenii*. Length of frond ten inches and a half, width four inches. Equal in width, except for one inch and a half below the branching apex, where it suddenly narrows to an inch in width, and then dilates to a multifid apex of one inch and a half in width. Pinnæ flexuose, broad at the base, and very narrow near the multifid apices. Pinnules conspicuously fringed with minute hair-like teeth. Stipes and rachis somewhat purple. The multifid apices long, narrow, and lax. The illustration was sent by Messrs. Stansfield, of Todmorden.

MULTIFIDUM-MINUS, *Moore*.—Found at Ilfracombe, Devonshire, by Mr. C. Jackson. A dwarf variety, not exceeding eight inches in length, being multifid at the apex of the fronds, and having a pencil-like tuft at the caudately-attenuated apices of the pinnæ. An illustration is unnecessary.



Fig. 293.

MULTIFIDUM-EDELSTENII, *Lowe*. (Fig. 293.)—A dwarf broad-fronded variety of *multifidum*, raised from spores by Mr. Edelsten, of The Woodlands, Mosely, near Birmingham. Length

of frond nine inches, width five inches. Stipes very short. Singularly leafy and plumose. Pinnæ opposite below and alternate above, equal in length, except at the ramose apex, and therefore making the frond equal in width near the apex and base. Pinnules long, narrow, and leafy, and very regular in outline. Dentation also very regular. The apices of the pinnæ multifid, and the apex of the frond branching and multifid. Vivid green in colour, and delicate in substance. The illustration is from Mr. Edelsten's frond.



Fig. 294.

MULTIFIDUM-TENUE, *Lowe*. (Fig. 294.)—A thin, very slender, bending-fronded form, found in the Channel Islands by Mr. J. James, of Vauvert. Fronds fourteen inches in length, and five inches and a half in width in the widest part. The pinnæ and pinnules closely resemble the normal form of *Lastrea filix-mas*, except in substance, which is as thin as tissue-paper. Apex of frond acuminate. Pinnules leafy and simply dentate. The apices of the pinnæ and of the fronds themselves furcate, the furcations being minutely multifid. I am indebted to Mr. James, of Vauvert, for fronds.



Fig. 295.

MULTIFIDUM-MAPPLEBECKII, *Lowe*. (Fig. 295.)—A very

leafy variety of *multifidum*, raised from spores by Mr. J. E. Mapplebeck, of Moseley, near Birmingham. Fronds symmetrical, ten inches long, four inches wide. Pinnæ opposite below, alternate above; approximate, overlapping each other, except the basal pair; the multifid apices small. Pinnules broad, touching each other without overlapping. The frond widest in the centre, gradually narrowing to the multifid apex. The illustration was sent by Mr. J. E. Mapplebeck.



Fig. 296.

MULTIFIDUM-COOLINGII, *Lowe*. (Fig. 296.)—A large-growing stout variety, raised by Mr. Edwin Cooling, Mile-ash Nursery, near Derby. Length of frond twenty-seven inches, width seven inches. Pinnæ narrow, distant, usually furcate, and the furcations multifid, broadest at the base, and narrowing gradually to the furcation. The superior basal pinnule the longest. Pinnules long, narrow, and deeply divided. Sori copious, becoming confluent, and covering the whole under side of the frond. The illustration is from Mr. Cooling's frond.

MULTIFIDUM SEMIDEPAUPERATUM, *Sim*.—Raised from spores by Mr. Sim, of Foot's Cray. In this variety the multifid apex and one side of the frond resemble *multifidum*, whilst the other side has the pinnæ considerably diminished in size, or even wanting, being excessively depauperated.



Fig. 297.

MULTIFIDUM-FRASERI, *Lowe*. (Fig. 297.)—Found in Scotland. A graceful variety. Pinnæ normal on one side of the rachis, and all except at the apex depauperate on the other side. The apices of the normal fronds furcate, and the furcations multifid. Pinnules long, narrow, abrupt-pointed, and conspicuously auriculate. Apex of the frond multifid. The pinnules immediately below the multifid crest not furcate. I am indebted to Mr. P. Neill Fraser, of Edinburgh, for fronds.



Fig. 298.—Portion of Frond.

EXCURRENS, *Moore*. (Fig. 298.)—Found in 1853, at Tunbridge Wells, and now in the possession of Mr. G. B. Wollaston, of Chiselhurst. This singular variety has the general form of the variety *molle*, but having rather distant decurrent pinnules. The peculiarity consists in the tips of the pinnæ, and occasionally of the pinnules and teeth, extending out into transparent

hair-like points, giving the appearance of an excurrent growth of the veins, hence its name. The Rev. J. M. Chanter has found near Ilfracombe a variety very similar, except that it has not the excurrent points.



Fig. 299.—Shewing form of Frond. 300.—Pinnæ.

RAMO-THYSANOTUM, *Monkman*. (Figs. 299 and 300.)—This beautiful form is in no way different from its parent *thysanotum*, except that it is uniformly bi- or tri-fronded, each division,

when luxuriantly grown, having a disposition to fork again. The pinnæ are exquisitely toothed; and the terminal and lateral crestings are large and very compound, but somewhat flabellate. Raised by Mr. C. Monkman, who supplies the fronds for illustration.



Fig. 301.—Portion of Frond.

MACILENTUM, *Moore*. (Fig. 301.)—A much-cut variety. Length of frond from twelve or thirteen inches, width five inches. Pinnæ irregular in size and form, sometimes acuminate or acute at the apex, at others abrupt, broad, or with furcate pinnules. Pinnules laciniated, lacerated, or as if eaten away, various in form and size. In the abnormal pinnules the sori are situated on the extreme edge, being marginal, and even supra-soriferous. The illustration is from Messrs. Stansfield.



Fig. 302.—Pinna.

MARINUM, *Moore*, (*Aberdeenense* of some Gardens.) (Fig. 302.)—Found some years ago in a cave by the sea-side near Aberdeen by Dr. Dickie, and more recently in the Isle of Man by Dr. Allchin. Length of frond from twelve to eighteen inches, rigid, spreading, or decumbent, and sub-bipinnate to bipinnate, elliptic-lanceolate in form, the pinnæ being longest in the centre of the frond, narrowing equally both towards the

base and apex. Pinnæ almost equal in width for two thirds of their length, eventually contracting into an acuminate point. Pinnules crowded, even overlapping, mostly largest next the main rachis, oblong and blunt in form with rounded apices, connected by a narrow wing set on at right angles, the margin toothed with narrow indentations, the lobes being scarcely developed. The scales at the base of the stipetes are almost black. Sori lunate; they are situated as a double line near the costa of the pinnules. An interesting plant, which I received some years ago from Dr. Dickie, through Mr. Mackay.



Fig. 303.—Pinna.

COURTAULDIÆ, Lowe. (Fig. 303.)—A graceful, multifid variety, raised in the Fernery at Highfield House. The chief peculiarities of this form are the curving downwards of all the pinnæ, and the exceedingly vivid green colour of the pinnules. Length of frond fifteen inches, width four inches in the centre of the frond, becoming narrower towards the base and apex. Pinnæ nearly equal in width, except a slight contraction near the branching apices, distant below, crowded and overlapping near the apex of the frond. Pinnules crowded, broad, blunt ended, and minutely bidentate. The pinnæ curve gracefully downwards, and the pinnules curve upwards, making the upper side of the pinnæ concave. The rachis red, dilated at the apex, where it becomes multifid, the crown being narrow, compact, and much lacinated.

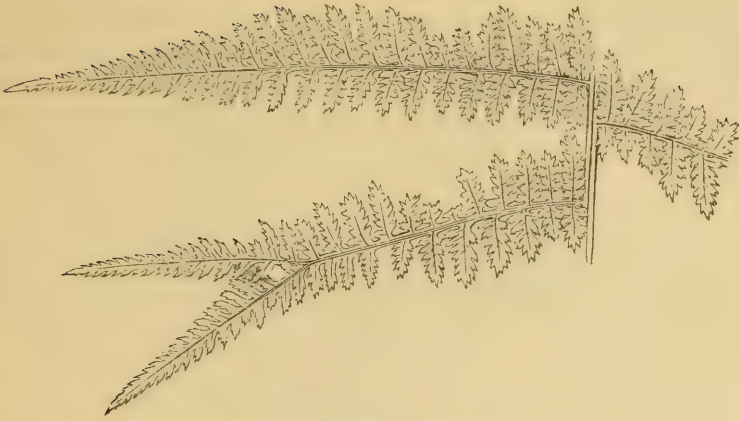


Fig. 304.—Portion of Frond.

RAMULOSUM, *Moore*. (Fig. 304.)—A form of *Athyrium* in which the fronds are furcate, but rarely ramose, all the apical parts forking or cresting. Found by Mr. C. Monkman, of Malton, at Oldstead, Yorkshire, and a similar form near Windermere.



Fig. 305.—Pinna.

INCISO-DIGITATUM, *Lowe*. (Fig. 305.)—A graceful multifid Fern raised from spores in the Fernery at Highfield House. Length of frond eighteen to twenty inches, breadth in the centre of the frond seven inches. Pinnæ alternate throughout the frond, narrowing to the base, distant below, and crowded near the apex. The apex of the frond somewhat ovate in form. Pinnæ equal in width, (except as regards the pair of

basal pinnules, which are larger than the rest,) and narrowing gradually towards the digitate tasseled apices. Pinnules stalked, and the lobes incised almost to the costa, and minutely dentate at the apices of the lobes, the basal anterior lobe the longest. The pinnæ multifid at their apices in every portion of the frond.



Fig. 306.

ALATUM-FRASERI, *Lowe*. (Fig. 306.)—Found in Corrifern Glen, in Peeblesshire, in July, 1860, by Mr. P. Neill Fraser, of Canon Mills Lodge, Edinburgh. Length nine inches, width not quite three inches in the widest part. A compact frond, with close leafy pinnules, somewhat imbricated, and having characters midway between *alatium* and *minimum*. I am indebted to Mr. Fraser for a frond.



Fig. 307.

APUÆFORME, *Moore*. (Fig. 307.)—Found at Ayburn Wyke, near Scarborough, by Mr. J. Horsfall, and made known to the public by Messrs. Stansfield, of Todmorden. This elegant dwarf variety somewhat resembles *Multifidum*, differing in the apuæform or fish-like outline of its fronds. Length from eight to ten inches, width in the widest part, (that is in the middle of the frond,) two to four inches. My thanks are due to Mr. Edwards, of Nuttal, for a plant, from which the illustration has been taken.



Fig. 308.—Frond reduced.

APPLEBYANUM, *Moore*. (Fig. 308.)—A very handsome variety. This remarkable Fern is in the possession of Messrs. Ivery, of Dorking and Reigate. Length of frond seventeen inches, width for the twelve inches nearest the base less than one

inch. Five inches from the apex the frond becomes branched, and again branched, and many of the pinnæ bi- or trifurcate. Pinnæ on basal half of frond distant, and for the first nine inches resemble those of *Frizellia*, then they more nearly resemble *Fieldia*, being abruptly branched and lying along the rachis wrapping over each other and hiding the rachis as if tiled over, except at the base of the branching apex of the frond ascend instead of descend, the pinnæ being very irregular in size and form. Pinnules much cut and divided to the costa. I am indebted to Messrs. Ivery for the illustration.

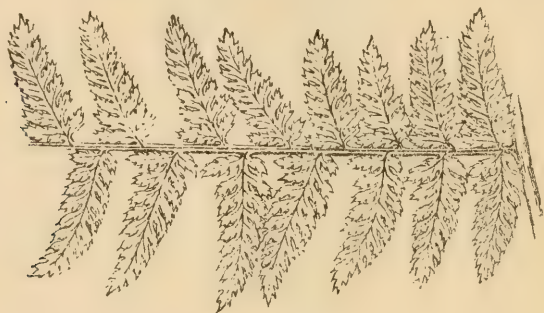


Fig. 309.

ARRANENSE, *Lowe*. (Fig. 309).—A distinct broad-fronded variety. Fronds two feet long, and nine to ten inches broad. Pinnæ opposite below, and alternate above, gracefully curving, approximate, equal in width, except the acuminate apex. Pinnules large and blunt pointed, briefly stalked, and deeply cut and auriculate. Sori abundant. Fronds yellowish green in colour. Found in the Isle of Arran, in September, 1863, by Mr. P. Neill Fraser, of Edinburgh, from whom I have received fronds.

ABRUPTUM, *Moore*.—Found at Port Erin, in the Isle of Man. A singular monstrosity with variable fronds. Pinnæ crowded, partially depauperated, pinnules oblong, unequally cut; at the apices of many of the pinnæ there are one or two large pinnules, but the normal gradually tapering apex is wanting as the apex is dilated and abrupt. Sometimes a normal frond occurs. An illustration is unnecessary.

INEXPLETUM, *Moore*.—Raised from spores by Mr. Sim, of Foot's Cray, Kent. A variety raised from *Multifidum*, curious from its depauperated, ragged, and incomplete fronds. Fronds slender, lax, eighteen inches in length, broadly lanceolate. The apices of the fronds and pinnæ depauperately caudate, and moderately and slenderly tasselled. Pinnules mostly depauperated, occasionally a mere rib, where most developed decurrent and very narrow. An illustration is unnecessary.



Fig. 310.—Portion of Frond.

BARNESII, *Lowe*. (Fig. 310.)—A very singular variety, found in 1860, in Levens Park by Mr. Barnes. Length of frond eight inches, width one inch. A long narrow-fronded form. The pinnæ, more properly speaking, are wanting, and their place substituted by wide, remarkably ragged, or lacinated

pinnules, and a terminal larger pinnule. Pinnules varied in size and form, being smallest near the apex, about fifteen or sixteen pairs on each frond. A dwarf delicate variety. The illustration is from Mr. Barnes' frond.



Fig. 311.—Shewing form of Frond. 312.—Middle pinnæ.

BIFIDUM, *Lowe*. (Figs. 311 and 312.)—Found near Edinburgh in 1859. An interesting dwarf slender-fronded variety in the *interruptum* section. Length of frond fifteen inches. In the centre the rachis divides into two distinct fronds. The apices

of the two fronds linear; one half of the pinnæ very short, few wanting, and several very long. Pinnules various in size and form, mostly depauperate, often only the teeth of the lobes or a portion of the lobes present. A pretty variety.

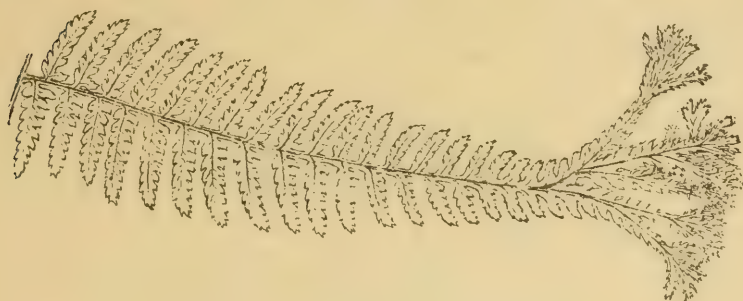


Fig. 313.

BALFOURII, *Lowe*. (Fig. 313.)—Raised from spores by Mr. James, of Vauvert. Another interesting multifid variety, very distinct in character, and named after Professor Balfour, the well-known Edinburgh Botanical Professor. Length of frond sixteen or eighteen inches; width almost equal, except near the apex, varying from five and a half to six inches. Pinnæ ascending, from four to four inches and a half in length, and an inch wide, broadest at the base, narrowing rapidly to a quarter of an inch just below the multifid apex. Tassels from one inch to one inch and a half in width, forming large conspicuous crests, the apex of the frond itself larger, and more multifid. Pinnules stout in substance, long, and narrow; lobes deeply cut near the base of the pinnules at the basal portion of the pinnæ, and very shallowly cut near their apices; in the upper half of the pinnæ the pinnules shallowly dentate, the upper portion entire, and only dentate at their apices. A graceful form. The illustration is from Mr. James' frond.

MINIMUM, *Moore*.—Found at Ilfracombe about the year 1856, and was in the nursery of the late Mr. Young, of Taunton. A very dwarf variety, the fronds being only six inches in length, and not one inch and a half broad. Bipinnate, the basal

pinnules distinct, the upper ones decurrent, with the base, confluent. Pinnæ somewhat irregular, and tapering to a point. Pinnules irregular in size and development, oblong, more acute upwards, profoundly pinnatifid, having toothed lobes below, and being inciso-dentate above. Teeth narrow and acute, the dentation producing a fringed appearance. Sori short and irregular, mostly situated at the base of the pinnules. An illustration is unnecessary.

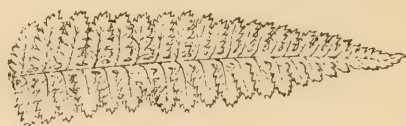


Fig. 314.

CRISPATUM, *Moore*. (Fig. 314.)—A pretty crispatated variety, in the possession of Mr. Swynfen Jervis, of Darlaston Hall. Fronds twelve inches in length, and three inches and a half in width. Rachis somewhat bending. Pinnæ on the lower half of the frond opposite, and on the upper half alternate, diminishing in length from the centre of the frond both towards the apex and base. Their apices blunt-pointed. Pinnules broad, leafy, and overlapping, their apices rounded and dentate. My thanks are due to Mr. Swynfen Jervis for fronds.



Fig. 315.

CURTUM, *Wollaston*. (Fig. 315.)—A pretty, compact variety, found by Mr. Joseph Wood at Bowness. Fronds eleven inches long, and two inches and a half broad in the middle. Very regular in outline. Fronds narrow and broadly pointed. Pinnæ short and broad, and blunt at their extremities. Pinnules

very leafy, vivid green, wide, and dentate along their edges, their apices flat and dentate. My thanks are due to Mr. Joseph Wood for the illustration.

ABORTIVUM, Lowe.—A singular abortive variety, found at Nettlecombe by Mr. Elworthy. Length ten inches, the basal five inches without pinnæ, indeed five pairs of pinnæ are all that the frond contains. Some of the pinnæ broad and triangular, others long and thin, or variously mis-shapen. Pinnules much lacinated or depauperated, the dentation very irregular. I am indebted to Mr. Elworthy for fronds. An illustration is unnecessary.



Fig. 316.—Pinnæ.

CONTORTUM, Stansfield. (Fig. 316.)—Raised from spores by Mr. Stansfield, of Vale Nursery, Todmorden, and proved quite constant. A slender form thirteen or fourteen inches in length, the fronds being three inches and a half wide. Pinnæ, and more especially the pinnules, much contorted or twisted back. Pinnules very various in form and size, some absent. My thanks are due to Messrs. Stansfield for fronds.

BULLERIÆ, Moore.—Found in 1858, in the neighbourhood of Tregulow, Cornwall, by Mrs. Hornby Buller, to whom Mr. Moore has dedicated it. An elegant crested form, peculiar as regards the long narrow teeth of its small pinnules, and the obtuse dilated sharp-toothed tufts which terminate the fronds and pinnæ. Length of frond twelve inches, breadth two inches.

Symmetrical below, and divided at the apex into a corymbose tuft of branchlets as broad as the frond itself. Pinnæ from seven eighths of an inch to one inch and a quarter in length, the basal ones deflexed, they are broadest at the base, and narrow gradually towards the apex. The tassel is dilate and many-branched, the divisions leafy at the sides, and having blunt dilated apices, which are sharply and conspicuously dentate. An illustration is not necessary.



Fig. 317.—Shewing form of frond.



Fig. 318.—Pinnæ.

CRISPUM, Moore. (Figs. 317 and 318.)—This slender, elegant, dwarf plant was originally found in Ireland, on Orah, a hill in County Antrim; subsequently in Corymulzie Lynn, Bræmar, Scotland, by Sir W. C. Trevelyan, and at Todmorden, Lancashire, by Mr. J. Huddert. *Crispum* more closely resembles a tuft of fine curled parsley than a Fern. Length of frond from six to twelve inches. The fronds branch in every possible manner, the rachis being irregularly divided, and each apex densely tufted in close obtuse tassels. Both the pinnæ and pinnules are very unsymmetrically divided, and the pinnæ are often wanting for a long portion of the stipes. I am indebted to Mr. Joseph Sidebotham, of Manchester, to Mr. J. Pearson, of Chilwell, and to Mr. C. Monkman, of Malton, for plants.

DIVERSIFRONS, *Moore*.—Raised from spores by Mr. Young, of Taunton. A pretty variety, having broad fronds. This variety produces two kinds of fronds, some not unlike *incisum*, and others remarkably depauperately laciniated. Pinnæ various in length, and in their outline, some linear and tapering to a point, others abbreviated and forked or hooked at the apex, the whole rachis occupied by the pinnules, or considerable bare irregular spaces. The pinnules irregularly pinnatifid and laciniated, occasionally depauperated either in length or breadth. An illustration is unnecessary.



Fig. 319.—Apex.

CORONATUM, *Moore*. (Fig. 319.)—A splendid dwarf Fern, well named on account of its enormous crowded apex. Length of frond eight inches, width one inch and a half, except the terminal crown, which is at least three inches and a half across. Rachis dilated from the centre of the frond, and throwing out a number of branches, which cross each other,

and produce a large, compact, much-divided tassel. The pinnæ below the tassel very brief, but more or less normal. Rachis red. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 320 — Frond.

CRISPUM-CORONATUM, *Lowe*. (Fig. 320.)—Mr. Monkman, of Malton, has sent me the present new Fern, which differs from the *crispum* in not having lax wide-spread branches, and in the corymbiferous head forming a compact somewhat circular crown. Length of frond nine inches, width three inches and a half; in *crispum* the width is six or seven inches. The pinnules crowded and overlapping each other.

DIFFISSUM-GRACILE, *Moore*.—Found at the Sulphur Wells, Harrogate, by Mr. Clapham, of Scarborough, resembling *Diffissum*, but having a more slender form. An illustration is needless.



CORYMBIFERUM, Moore. (Plate XXXVII.)—A very handsome, robust-growing, tasselled variety, found in Guernsey by Mr. James, of Vauvert. It has been raised so abundantly from spores, that this remarkably handsome variety is not uncommon. It differs in the great breadth of its pinnules, in the larger size of its tasselled apices, and by its red stipes and rachis. Length of frond from eighteen inches to nearly three feet, and from six to ten inches broad. Pinnæ approximate, oblong, but slightly tapering towards the apex, the rachis dividing into three branches about six or eight inches below the apex, each branch being bipinnate, and tufted corymbosely. Along the rachis of these branches the pinnules are uninterruptedly continued, and thus materially increasing the breadth of the tuft. Pinnules broad, oblong, blunt, and somewhat connected, as in *molle*; they are set immediately on the rachides, giving the frond a peculiar breadth and fulness. The corymbose termination is large and spreading, bearing pinnules throughout. My thanks are due to Mr. James, of Vauvert, and to Mr. E. Cooling, of Derby, for fronds.



Fig. 321.—Pinna.

CORYMBIFERUM-LOWEI, Lowe. (Fig. 321.)—Raised from spores at Highfield House. Length of frond twenty-two inches, width in centre eight inches. This form differs in the flat wide-spreading multifid apices of the pinnæ, and in the flat many-branched compact ultimate crest. It also differs in habit, the fronds rising from the crown at an angle of about 50° , the apices alone weeping. Being a young plant, next season it is probable that it may be even finer than in 1864.



Fig. 322.—Pinnæ.

DAREOIDES, *Moore*, (originally named *Davallioides* by Mr. G. B. Wollaston.) (Fig. 322.)—Discovered in Ireland in the year 1854, near Castle Kelly, County Dublin, by my late much respected friend Dr. Kinahan; and subsequently a somewhat similar variety has been found near Todmorden by Mr. Stansfield. A singular distinct *Darea*-looking variety, having the pinnules pinnatifid, the indentations entire at their edges, and having the sori situated in the angle, causing the spore-cases to project beyond the margin of the frond. The pinnules also bulge forwards. Mr. Stansfield's plant has fronds eighteen inches in length, and nine inches in breadth, ovate-lanceolate in form, with approximate pinnæ and somewhat distant pinnules. The pinnæ overlap each other, and are broad linear-oblong, tapering to a long point. Pinnules distinct, ovate-oblong in shape, profoundly pinnatifid; lobes narrow, and only toothed at the end, and having very open sinuses. Some lobes have merely a single vein, the sorus being situated on a short fork near the base, other lobes have two, three, or four branch veins. Sori small, forming a single row on either side of and near to the costa, and just abutting on the sinus.

DECOMPOSITUM, *Moore*.—Found in Cornwall, at Penryn, by Mr. G. Dawson; in Somersetshire, near Nettlecombe, by Mr. C. Elworthy; in Kent, at Chiselhurst, by Mr. G. B. Wollaston; in Hampshire, at Basingstoke, by Mr. F. Y. Brocas; in Worcestershire, at Daylesford, by Mr. H. Buckley; in Denbighshire, at Ruthin, by Mr. T. Pritchard. In Ireland at Lisdoonvarna, County Clare, by Mr. R. Barrington; and at Chaigeley Manor,

near Clitheroe, in Lancashire, and at Corby Castle, near Carlisle, by myself. Fronds quite tripinnate. The pinnules are divided to the midrib at the base, and the brief oblong blunt secondary pinnules are toothed along their sides, or even pinnatifid with dentate lobes. Length of frond two feet, width eight inches. Pinnæ widest in the widest part of the frond, narrowing and shortening towards the base and apex. This variety differs in the pinnatifid character of the secondary lobes from *incisum*. It is therefore a more decompound form of *incisum*, and very graceful. No illustration is necessary.



Fig. 323.—Pinnæ.

DIFFISSUM, Moore. (Fig. 323.)—Found originally in Guernsey by Mr. James, of Vauvert, and subsequently in the Isle of Man by Dr. Allchin, at Taret, in Dumbartonshire by Mr. T. Moore, of the Chelsea Botanic Gardens, and at Todmorden, Lancashire, by Mr. A. Stansfield. An accidental seedling of this variety also came up in Mr. Monkman's fernery at Malton. Not unlike *dissectum* in the open irregular manner in which the pinnules are cut, and having intermediate characters between this variety and *laciniatum*. An elegant Fern, with fronds eighteen inches in length, and broadly lanceolate in form. Pinnæ close together, and tapering gradually to a narrow point. Pinnules approximate, irregular both in their size and shape, mostly ovate-oblong, profoundly pinnatifid, with lobes unequally-toothed, separated by an open sinus. I am indebted to Mr. C. Monkman, of Malton, Mr. Swynfen Jervis, of Darlaston Hall, Mr. James, of Vauvert, Mr. Sim, of Foot's Cray, Messrs. Stansfield, of Todmorden, and to Mr. E. Cooling, of Derby, for fronds.



Fig. 324.—Pinnæ.

DEFECTUM, *Wollaston*. (Fig. 324.)—Found in July, 1860, at Drummelzien, near Broughton, by Mr. P. Neill Fraser. Length of frond sixteen or seventeen inches; width very variable, sometimes as much as six inches. No two pinnæ alike in shape, and very various in size. Mr. Wollaston remarks that this variety is the exact counterpart of the variety *varians* in *Polystichum angulare*, and therefore it is a pity that name has been already taken up. The fronds are sometimes split on the rachis, and become twin. My thanks are due to Mr. P. Neill Fraser for fronds.



Fig. 325.—Pinna.

DIGITALE, *Lowe*. (Fig. 325.)—A multifid variety, raised from spores by Mr. Edwin Cooling, of Derby. This variety is not unlike the *Cynodon dactylon*, or Creeping Finger Grass, hence its name. *Digitale* most nearly resembles *Balfourii*, differing in the pinnæ and pinnules being narrower, and in the linear digitate multifid apices. A lax form. Length of frond twenty-six inches, width only five inches. Pinnules

recurving, occasionally depauperated, and even wanting. Copiously and conspicuously soriferous throughout the frond. My thanks are due to Mr. Cooling for fronds.



Fig. 326.—Apex.

Fig. 327 —Pinna.

DENTICULATUM, *Wollaston*. (Figs. 326 and 327.)—Found in 1861 near Gate Beck by Mr. Barnes, of Milnthorpe. Length of frond thirteen inches, width three inches and a half. Outline normal, thick and solid in substance, and dark green in colour. Pinnæ regular, distant below, crowded above, about a score pairs. Pinnules varying in size and form, often

dilating into a rounded apex, which is thickly set with prominent teeth: the multiplicity of the teeth is a characteristic feature of the variety. My thanks are due to Mr. Barnes for the illustration.



Fig. 328.—Frond.

DEPAUPERATUM, *Wollaston*. (Fig. 328.)—A remarkable variety found many years ago in Ireland, near Ben Bulgen in Sligo, by Mr. J. Gunning, the foreman at the Dublin College

Botanic Gardens, and distributed by Dr. J. T. Mackay. A tasseled-fronded monstrosity of unsymmetrical development. Length of frond from eight to fourteen inches. Pinnæ tasseled, segments narrow and minutely lacerate, below the tassel depauperated and irregularly laciniated. Pinnules exceedingly irregular, often wanting. Apex of the frond profoundly laciniated, forming a large corymbiform tassel. There are several forms raised from spores with more or less compact tassels. I am indebted to the Rev. C. Padley, Bulwell Hall; Mr. Thomas Moore, of the Chelsea Botanic Gardens; Mr. Clapham, of Scarborough; and to Mr. Edwin Cooling, of Derby; for plants.



Fig. 329.—Apex.

DEPAUPERATUM-EDELSTENII, *Lowe*. (Fig. 329).—A sub-variety of *depauperatum* raised from spores by Mr. F. A. Edelsten, of the Woodlands, Moseley, near Birmingham. Length of frond ten inches, breadth of tassel four inches and a half. This variety differs only in the more perfectly corymbose apex, being more perfectly branched than usual, and in being closer and more finely fimbriated on the edge. The illustration is from Mr. Edelsten.



Fig. 330.—Pinna.

DIFFISSO-MULTIFIDUM, *Lowe*. (Fig. 330.)—A narrow-fronded distinct and interesting Fern. Length twelve or fourteen inches, width three inches and a half. In addition to the characters of *diffissum*, the apices of all the pinnules are conspicuously multifid, and the frond itself terminates in a large multifid apex. This variety was found at Nettlecombe, Somersetshire, by Mr. Charles Elworthy, to whom I am indebted for fronds.

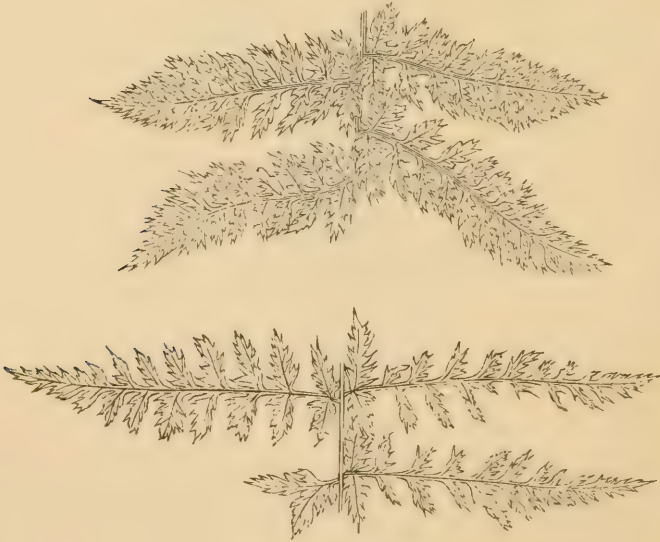


Fig. 331.—Pinnæ of young frond.

Fig. 332.—Pinnæ of mature frond.

DISSECTUM, *Wollaston*. (Figs. 331 and 332.)—This lax and elegant Fern was found in Ireland by Dr. Young. Fronds

stout, only twelve inches in length, and seven inches in breadth, broadly oval, and irregular in appearance. Symmetrical in outline. Pinnæ crowded, not quite equal in length, broad to near the apex and then suddenly acuminate. Pinnules rather distant, decurrent, irregular in shape and size, mostly ovate-oblong, blunt, and cut into distant unequally-dentate lobes, separated by wide open sinuses.



Fig. 333.—Middle pinnæ.

DISSIMILE, *Crossfield*. (Fig. 333.)—A dwarf, slender Fern, found at Arnside by Mr. Crossfield. Length of frond eight inches, width one inch and three quarters. Pinnæ opposite except near the apex, the basal three pairs varying much in size and form, beyond which the outline is regular. Fronds pinnate, the lobes of the pinnæ cut quite to the costa and finely dentate, their apices rounded. I am indebted to Mr. Monkman, of Malton, for a frond.



Fig. 334.—Pinna.

ELONGATUM, *Wollaston*. (Fig. 334.)—An interesting, large, slender Fern, found in 1861, in Brigsteur Wood, by Mr.

Barnes. The name is hardly an appropriate one, although the superior basal pinnule is nearly twice the length of any of the others. Fronds symmetrical in form. Pinnæ approximate, caudately acuminate near the apex. The superior basal pinnule exceedingly large, and distinctly stalked, the lobes of the pinnules deeply cut; and copiously, minutely, yet distinctly dentate. My thanks are due to Mr. Barnes for fronds.



Fig. 335.—Shewing form of frond.



Fig. 336.—Pinna.

ELWORTHII, Moore. (Figs. 335 and 336.)—A magnificent multifid Fern, found near Nettlecombe by Mr. Charles Elworthy. Fronds thirty inches in length, and seven inches in width in the widest part; stout in substance. Pinnæ ascending and arching gracefully, as if bent by the weight of the heavy fan-shaped multifid apex of each pinna; opposite below and alternate above. Pinnules linear-oblong, flat or dilated at the

apex, and fimbriated with many minute teeth on the extreme end; lobes deeply cut, forming a row of coarse serrate teeth along the edges of the pinnules. This is one of the handsomest and most densely tasseled of the multifid varieties. I am indebted to Mr. Elworthy, of Nettlecombe, for fronds.



Fig. 337.—Pinna.

EROSUM, Wollaston. (Fig. 337.)—Found in Kent, near Tunbridge Wells, by Mr. G. B. Wollaston; at Marwood, in Devonshire, by the Rev. F. Mules; and on Cahir Conree, near Tralee, county Kerry, by Dr. Allchin. This variety is normal in size, and lanceolate and almost normal in form, the pinnæ also normal in size. The pinnules mostly variously depauperated, and therefore unequal in size, the lobes also disproportionately developed, the frond having an irregularly lacinated appearance; occasionally the pinnules are somewhat normal, blunt, oblong, pinnatifid, decurrent, the lobes unequal, with brief blunt teeth. The pinnules occasionally bifid or multifid. An approach to this variety, yet more normal in its characters, has been found in the Isle of Man by Dr. Allchin.

EROSUM-MINUS, Moore.—Found near Windermere, by Mr. F. Clowes. An elegant diminutive form of *erosum*. Fronds

twelve inches in length, narrow, irregular. The pinnæ tapering but not acuminate. Pinnules unequal and irregular. An illustration is not needed.



Fig. 338.—Pinnæ.

EROSA-DECURRENS, *Moore*. (Fig. 338.)—A dwarf form, scarcely a foot in length, and two inches in width. Slender and thin. Pinnæ descending in the lower half of the frond, and ascending and curving in the upper portion, their apices ending abruptly, and much lacerated. Pinnules decurrent and erose, and very various in size, sometimes wanting. The apex of the frond dilated, with a branching much-lacinated terminal pinnule. The illustration is from Messrs. Stansfield.



Fig. 339.—Pinnæ.

EXILE, *Moore*. (Fig. 339.)—A dwarf form from Todmorden and from Antrim, found by Mr. A. Stansfield, and in Levens Park by Mr. Barnes. Less depauperate than *laciniatum*, and more slender than *dissectum*. Pinnæ irregular, narrow, and long-pointed; pinnules unequal and linear-oblong, profoundly pinnatifid, having occasional enlarged lobes producing ramose pinnules. Dentation short and blunt. I am indebted to Mr. Barnes for fronds.



Fig. 340.—Portion of pinna.

EXTREMO-DIGITATUM, *Lowe*. (Fig. 340.)—Raised accidentally in my Fernery. A slender variety, fronds fourteen inches long, and four inches and a half broad in the centre, slightly narrowing towards the base, and acuminate at the apex. Pinnæ opposite below, alternate above, lax, broadest in the centre, narrowing slightly towards their base, and acuminate at their apices. The extreme points terminating in conspicuous though minute digitate crowns. Pinnules long, narrow, slightly recurved, and conspicuously fringed with long, narrow, lacinate teeth.

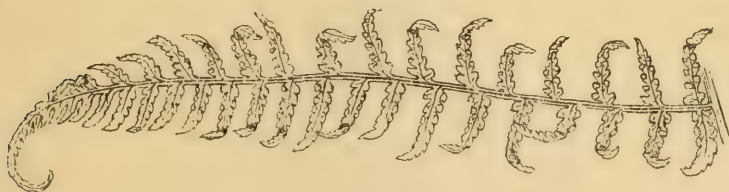


Fig. 341.—Pinna.

FLEXUOSUM, *Moore*. (Fig. 341.)—Found at Windermere by Mr. J. Huddart. Not unlike *rhæticum* in its upright growth, its distant ascending pinnæ, and its distant narrow convex pinnules, with incurving lobes; differing, however, in the flexuose character of the main rachides, and sometimes of the stipites, often grotesquely twisted. Length nineteen inches, width six inches and a half. I am indebted to Mr. P. Neill Fraser, of Edinburgh, for fronds.

FLAVO-TINCTUM, *Wollaston*, (*Curtum*, *Moore*.)—Found by Mr. Barnes near Levens in 1861. Fronds irregular. Named

from the yellow green colour of the fronds. Length seven inches, width three inches in the widest part. Pinnæ various in size, alternate, distant, nearly twice the size on one side of the rachis to what they are on the other, the lower basal pair, which are small and rounded at their apices, or triangular more or less, are descending, the rest horizontal; the apex of the frond composed of about half a dozen pinnatifid pinnules, occasionally a pinna will be a third of the size of the whole frond. Pinnules mostly somewhat distant, broad, rounded, and bidentate, giving the frond a fimbriated appearance, the superior basal pinnule the largest; occasionally depauperated, or much abbreviated. Pinnæ sometimes wanting. My thanks are due to Mr. Barnes for fronds. An illustration is unnecessary.



Fig. 342.—Middle of Frond.

FIELDIÆ, *Moore*. (Fig. 342.)—A remarkable and distinct variety found by Mr. Field. This in *Athyrium* is a counterpart of *Elworthii* in *Polystichum angulare*, (see page 153, vol. i.) The fronds are more than two feet in length, and only one

inch wide, except immediately below the apex, where they are one inch and a half in width. The basal six inches destitute of pinnæ. Pinnæ approximate, except at the base; brief, abbreviated, stalked, and divided at the base into two short divergent equal-sized pinnæ, part ascending and part descending, giving the frond a cuneiform appearance; the frond terminating in a normal narrow unbranched apex. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, for fronds.



Fig. 343.—Middle of Frond.

FIELDIÆ-PUMILUM, *Moore*. (Fig. 343.)—A dwarf form of *Fieldiæ*, forwarded to me by Mr. Ivery, of Dorking. Length of frond thirteen inches, width from base to apex only half an inch; the apex rounded, and for the last two inches only half an inch wide. Pinnæ crowded, some of the pinnules of the abrupt branching pinnæ ascending, and others descending. I am indebted to Mr. Ivery for fronds.

FURCATUM, *Moore*.—Found near Ilfracombe, Devonshire, by the Rev. J. M. Chanter. Differing in having the tips of the pinnæ forked, mostly once forked, occasionally twice or thrice forked, and having a tendency to dilatation in the tips. The apex of the frond is divided into a brief diminutive tassel. It is not necessary to give an illustration.



Fig. 344.—Pinnæ.

FISSIDENS, *Moore*. (Fig. 344.)—Found near Nettlecombe by Mr. Charles Elworthy. Fronds very irregular in outline, fifteen inches in length, and four inches in the widest part. Pinnæ very various in size, from half an inch to two inches and a half, and very various in shape, many as if split down the rachides, and only containing pinnules on the anterior side. Pinnæ very short on the basal half of the frond, wide in the middle, and short again near the apex of the frond. Pinnules various in size and form, the more developed ones much lacinated, depauperated, and many wanting; copiously dentate, with long narrow teeth. The illustration is from Mr. Elworthy's frond. I am also indebted to Mr. Swynfen Jervis, of Darleston Hall, Staffordshire, for fronds.

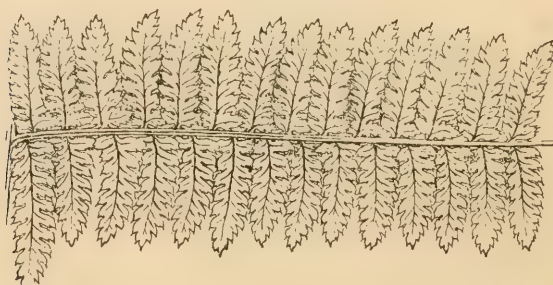


Fig. 345.—Portion of pinna.

FRASERII, *Lowe*. (Fig. 345.)—A handsome, broad-fronded Fern, of a deep green colour, found in Larrington Glen, Lanarkshire, in June, 1863, by Mr. P. Neill Fraser, of Canon

Mills Lodge, Edinburgh. Length of frond forty inches, breadth ten inches. Pinnæ five to six inches long, and from an inch and a quarter to an inch and a half wide. Pinnules some three quarters of an inch long, and a quarter of an inch wide. Pinnæ alternate, linear-oblong or linear-lanceolate, with an acuminate caudate apex. Pinnules long, blunt-pointed, entire, and fringed on the sides with short teeth, and divided to the rachides. Sori diminutive. The illustration is from Mr. P. Neill Fraser.



Fig. 346.—Middle of Frond.

FRIZELLÆ, *Bain*. (Fig. 346.)—A distinct and beautiful variety. Length of frond fourteen inches, width equal throughout, namely, half an inch. Pinnæ branching immediately on the rachis, and producing a short rounded or a solid, leafy, semi-circular, flabellate-formed pinna, fimbriated with teeth on the edge. Opposite below, alternate above, and the frond ending in a rather larger terminal similar pinna; occasionally pinnæ are produced not unlike those of *Fieldiæ*. My thanks are due to Mr. E. Cooling, of Derby, and to the Rev. C. Padley, of Bulwell Hall, for plants, and to Mr. Ivery, of Dorking, and to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 347.—Apex.

FRIZELLIÆ-NANUM. (Fig. 347.)—A dwarf form of *Frizelliæ*, fronds only eight inches in length, the pinnæ subopposite and rather larger than in *Frizelliæ*. My thanks are due to Mr. Ivery, of Dorking, for fronds.

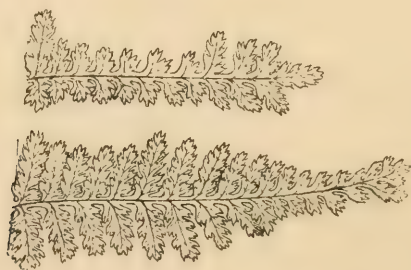


Fig. 348.—Upper pinna.

Fig. 349.—Middle pinna.

FORMOSUM, *Lowe*. (Figs. 348 and 349.)—A lovely Fern, raised from spores by Mr. Edwin Cooling, of Mile Ash Nursery, Derby. Length of frond sixteen inches, width three inches and a half in the widest part, decreasing rapidly in width towards the base, and gradually towards the apex, the

termination being abrupt. Pinnæ short and very distant at the base, and subopposite; from the middle of the frond alternate and approximate. The four basal pairs of pinnæ sterile, the others boldly and copiously soriferous. Pinnæ broadest at the base, and nearly equal in width for half the length, then suddenly and abruptly only half the width, yet again equal in width to the apices, which are frequently dilated and rounded more or less. Pinnules close together, touching without overlapping throughout the frond, the basal portion ovate-oblong and conspicuously dentate, those on the upper half of the pinnæ various in form, mostly broader than long, and only dentate at their broad apices. A charming variety, for which I am indebted to Mr. Cooling.

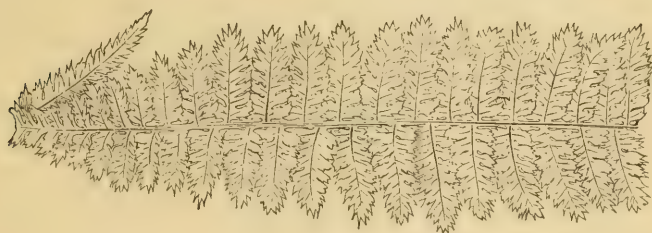


Fig. 350.—Portion of pinna.

FRONDOSUM, *Moore*. (Fig. 350.)—Found at Mayford, in Surrey, by Mr. Thomas Moore; at Nettlecombe, in Somersetshire, by Mr. C. Elworthy; and at Ruthin, in Denbighshire, by Mr. T. Pritchard. In this large compound variety the fronds reach a length of three feet, and are very broad and lanceolate, having wide approximate pinnæ and crowded pinnules. This variety differs in the crowded pinnules causing it to have a very leafy appearance. The pinnæ are irregular in their outline, and gradually narrow to a long tapering point. The largest pinnules are an inch long, and three eighths of an inch broad; they are pyramidal in form, and are pinnatifid nearly to the midrib. The lobes are blunt and oblong-toothed, the basal anterior ones often bearing six or more sori, arcuated in form. In the Mayford plant the stipites and rachides are red.



Fig. 351.—Pinna.

FURCILLATUM, *Moore*. (Fig. 351.)—A lax multifid form, found at Nettlecombe, Somersetshire, by Mr. C. Elworthy. Fronds fourteen inches long, and five inches wide. Rachides slender. Pinnæ distant, narrow, tapering to a long slender-caudate point, the tip of which is slenderly furcate, and divided into a tuft of flat brief segments. The apex of the frond is also two or three times divided into narrow forking segments. Pinnules distant, sessile, and decurrent, oblong acutish, and pinnatifid or inciso-dentate above, narrowing near the base into the entire decurrent portion. Remarkable for its narrow terminal forks and lax habit. Fronds have been sent by Mr. Elworthy, and also by Mr. P. Neill Fraser, of Edinburgh.



Fig. 352.—Middle pinna.

GLOMERATUM, *Moore*. (Fig. 352.)—A very handsome and remarkable variety, received from Mr. Ivery, of Dorking. The fronds are about fourteen inches in length, and from four to four inches and a half wide. Pinnæ usually subopposite,

ascending and curving, widest at the base, and terminating in a large close-set heap of pinnules and lobes, forming a compact, much-multifid crown. In some fronds the pinnæ are shorter, large-tasseled, and the tassels overlapping each other. Near the apex of the frond the rachis becomes flat and dilated, and this also applies to some of the rachides. My thanks are due to Mr. Ivery, of Dorking, for fronds.



Fig. 353.—Apex.

GRANTIÆ, Moore. (Fig. 353.)—A dwarf Fern. Fronds nine inches long, and four inches wide, pinnato-pinnatifid. Pinnæ crowded, the pinnules broad and somewhat imbricate occasionally. The broadest pinnæ two inches and a half in length and acuminate, pinnules broad and blunt at the apex, where minutely and simply dentate. A variety almost indetical was shewn to me some years ago by Mrs. Riley, of Papplewick, Nottinghamshire, and last year I found a similar plant at Dale Abbey. A form is also to be found near Sweden Bridge, Ambleside, which may be referred to this variety, except as regards the fact that with *Grantiæ* the margins of the leaflets are undulated, so as to produce a prettily crimped appearance. My thanks are due to Mr. P. Neill Fraser, of Cannon Mills, Edinburgh, and to Mr. Ivery, of Dorking, for fronds.

GRANDICEPS, Moore.—Found near Nettlecombe, Somersetshire, by Mr. C. Elworthy, and at Huish-Campflower, near Wivelis-

combe, by Mr. J. Morse. An exceedingly handsome and distinct variety. Length of frond eighteen inches, bipinnate, pinnæ distant. The apex of the frond expands into a large multifid-crispy head, broader than the frond. The chief characteristic is the large size of the multifid apex, which is three inches and a half in length and five inches in width, being composed of a dense mass of segments, forming a somewhat circular crispy bunch. Another characteristic is the small inconspicuous tassels of the pinnæ. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, and to Mr. Elworthy, of Nettlecombe, for fronds. An illustration is unnecessary.



Fig. 354.—Pinna.

INCISUM, *Hoffman*, (*Athyrium filix-fœmina*, var. *incisum*, Newman, Sowerby, Moore; *Athyrium incisum*, Newman; *Athyrium cyclosorum*, Ruprecht; and *Polypodium incisum*, of Hoffmann.) (Fig. 354.)—A widely spread and not uncommon variety. It has been found at Penryn, in Cornwall, by Mr. G. Dawson; at Marwood and Bittadon, in Devonshire, by the Rev. F. Mules; Nettlecombe, Somersetshire, by Mr. C. Elworthy; at Bath, by myself; at Mayford, Surrey, by Mr. T. Moore; Daylesford, in Worcestershire, by Mr. H. Buckley; in Herefordshire by Mr. G. Dale; Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; at Chaigeley Manor, near Clitheroe, Lancashire; near Ambleside; in Teesdale; and at Corby Castle, near Carlisle, by myself; at Edinburgh, and in County Donegal, County Mayo, County Wicklow, and County Dublin, by Mr.

R. Barrington; and at Killarney by Mr. N. B. Ward and Mr. G. H. Allcock. A large-growing handsome variety, with fronds from three to five feet in length, and in the large fronds twelve inches in breadth; drooping and feathery. Broadly lanceolate. Pinnæ ascending, and nine or ten inches in length, broad oblong, tapering to a slender point. Pinnules an inch and a half long, and five eighths of an inch wide at the base, and frequently so profoundly divided that the fronds are almost tripinnate, linear-lanceolate, and distinct. Lobes forming open sinuses, and toothed at the margin and apex. Sori abundant. Fronds have been received from the Rev. F. Mules, of Marwood; Mr. Swynfen Jervis, of Darlaston Hall; Mr. Kennedy, of Covent Garden; Mr. Joseph Sidebotham, of Manchester; Mr. John Pearson, of Chilwell; Messrs. Stansfield, of Todmorden; Mr. Cooling, of Derby; Mr. Willison, of Whitby; Mr. Elworthy, of Nettlecombe; and the Rev. J. Rooper, of Brighton.



Fig. 355.—Pinnæ.

GRANDIDENS, *Moore*. (Fig. 355.)—Length of frond eighteen inches, width scarcely four inches in the widest part. A narrow-fronded variety, not unlike the variety of this name of *Polystichum angulare*. Pinnæ small at the base and descending, from the centre of the frond not descending; somewhat distant. Pinnules normal, and coarsely-dentate near the base, but in the upper half of the frond variously-shaped and depauperated. I am indebted to Mr. Swynfen Jervis, of Darlaston Hall, for the illustration. Messrs. Stansfield have sent fronds more *Cystopteris*-looking.



Fig. 356 — Middle pinnae.

HARRISLÆ, Lowe. (Fig. 356.)—An interesting variety, raised at Highfield House from spores. Length of frond twelve or fourteen inches, width in the centre of the frond four inches, narrowing slightly towards the base, and acuminate towards the apex, where it again dilates into a multifid slender crown. The pinnae are narrow, and tapering to a long point, the extremity minutely multifid. Pinnules long and narrow, and of thin substance, the teeth along their edges reflexed on to the pinnule. Pinnules decurrent, lax, and those on the upper edge of the rachides bending, and giving the appearance of pinnules only on the lower side of the rachides. The multifid apex slender, and minutely laciniated along the tips.

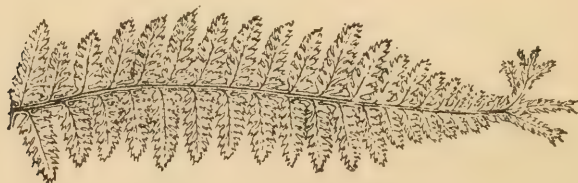


Fig. 357.—Pinna.

INCISO-MULTIFIDUM, Lowe. (Fig. 357.)—Found by the Rev. Mr. Pinder. Fronds long, narrow, and graceful. Length of frond twenty inches, width at the middle six inches, narrowing to the base and apex. Pinnae linear-oblong, acuminate, terminating in a small multifid apex; distant below, approximate from

the centre of the frond upwards. Fronds regular in outline. Pinnules linear-oblong, rounded at their apices, the basal lobes divided to the costa, and minutely but conspicuously dentate or bidentate. Vivid green in colour. I am indebted to the Rev. Mr. Pinder for fronds.



Fig. 358.—Pinnæ.

IMPASTUM, Moore. (Fig. 358.)—A singular dwarf variety, found in the Vale of Todmorden by Messrs. Stansfield. Length of frond twelve inches, width two inches in the widest part, narrowing to the base and apex. A thin-substanted, vivid green frond. Pinnæ various in length, their apices somewhat caudate. Pinnules small, many all but absent, irregular in size, shape, and position. Minutely dentate, or often not dentate. The illustration is from Messrs. Stansfield. Fronds also received from Mr. P. Neill Fraser, of Edinburgh.



Fig. 359.—Middle pinnæ.

INCOMPLETUM, Moore. (Fig. 359.)—A narrow-fronded variety, found near Nettlecombe by Mr. Elworthy. Length twenty-one

inches by three inches and a half in the widest part. Stipes red. Pinnæ somewhat distant, and various in size, occasionally wanting. Pinnæ of very many forms and sizes, pyramidal, circular, depauperated, laciniated, or wanting. My thanks are due to Mr. Elworthy for fronds.



Fig. 360.—Shewing form of Frond.



Fig. 361.—Pinnæ.

INTERRUPTUM, *Wollaston*. (Figs. 360 and 361.)—Found at Ambleside, Westmoreland, by Mr. G. B. Wollaston, of Chiselhurst, and independently raised from spores by Mr. J. Young, of Taunton. A singular variety, with shortened pinnæ. The fronds somewhat dwarf, and occasionally branched near their apices, and becoming bifurcate and even trifurcate. The pinnæ differ considerably both in their length, form, and mode of division, their apices usually simply or multifidly divided, and so become ramose. The pinnules also differ much in size, and in the number and shape of the lobes, which are also variously toothed, the serratures frequently acute and profound.



Fig. 362.—Pinna.

IRREGULARE, *Moore*. (Fig. 362.)—Found in 1854, in Belvoir Woods, Rutlandshire, by Mrs. Rogers; subsequently at Virginia Water, Surrey, by Dr. Allchin; in Black Park, Buckinghamshire, and in the Isle of Man, by Dr. Allchin; and somewhat analogous varieties at Harrogate, by Mr. A. Clapham; and in Sussex by Mr. S. Nowell. As its name implies, this is a variety with an irregular development. Pinnæ distant, having in the upper half linear-lanceolate, acute, incised, normal pinnules, of three quarters of an inch in length, and on the lower half considerably though irregularly shortened, often roundish and pinnatifid, with serrated lobes, sometimes normal larger pinnules intermingled; often the basal anterior pinnule is long and narrow.



Fig. 363.—Middle of Frond.

IVERYANUM, *Moore*. (Fig. 363.)—A new dwarf Fern in the manner of *Fieldia*. Fronds nine inches long and one inch broad. The rachides suddenly branching close to the main rachis into two unequal-sized pinnae, a short portion ascending,

and the longer portion descending, and thus clothing the whole of the rachis. The apices of the pinnæ are more flat than round, and the pinnules, which are fringed with minute teeth, are overlapping. Stem purple. My thanks are due to Mr. Ivery, of Dorking, for fronds.

INTERRUPTUM.—Mr. Elworthy's form of *Interruptum*, from which I believe Mr. Moore took his name, was found near Nettlecombe. Fronds twenty-six inches long, and seven inches wide in the broadest part. A very lax Fern. Pinnæ distant, about sixteen pairs, sub-opposite below, alternate above; singularly various in size and form. Pinnules nearly all depauperate, the costa only present, or even this wanting. Usually the anterior basal pinnule much the longest. Sometimes the upper half of the frond is contracted to an inch in width, for at least six inches in length. I am indebted to Mr. Elworthy for fronds. An illustration is unnecessary.

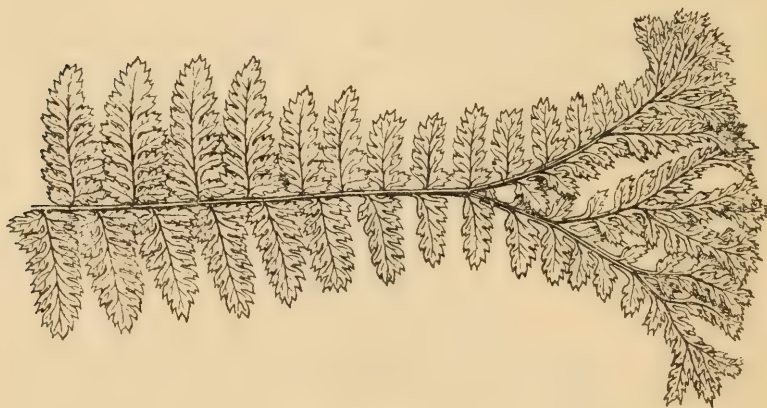


Fig. 364.—Portion of pinna.

JAMESII, *Lowe*. (Fig. 364.)—A magnificent variety, raised from spores from *corymbiferum* by Mr. James, of Vauvert. A large-growing wide-fronded form, of an ovate shape. Length of frond eighteen inches, width in the widest part eleven inches. Length of pinnæ six inches, width of the multifid apices of pinnæ two inches and a half. Pinnæ alternate,

large, slightly widest in the centre, and branching two inches below the apices into many-branched, large, bold, corymbiferous crowns. The apex of the frond also suddenly very much branched. Pinnules leafy, broad, large, and overlapping, their basal half divided to the costa, dentate or bi-dentate. A magnificent variety, for which I am indebted to Mr. James.



Fig. 365.—Portion of pinna.

KALON, *Lowe*. (Fig. 365.)—Another handsome multifid variety, raised from spores by Mr. James, of Vauvert. Length of frond sixteen inches, breadth eight inches in the widest part. Pinnæ sub-opposite or alternate, somewhat lax, the basal half equal in width, narrowing to the apex, where branched into a large and delicate corymbose crown. The pinnules long, leafy, and deeply cut, their apices dilated, bifid, or even branched. This variety shews a strong disposition to branch even in the smaller pinnules. Sori copious, five or six pairs on each pinnule. A distinct and good variety. The illustration is from Mr. James' frond.

LACINIATUM-MAGUS, *Moore*.—Found at Tunbridge Wells by Mrs. Delves. Larger than *laciniatum*, the fronds being two feet in length. Similarly depauperated in the upper half, and more normal in the basal half. Fronds very broad. In some respects not unlike *irregulare*. My thanks are due to Mr. Elworthy, of Nettlecombe, for fronds.

LACINIATUM-MINUS, *Moore*.—Found at Ilfracombe, Devonshire, by Mr. C. Jackson. Like a dwarf *laciniatum*. Dwarf,

only six or eight inches in length. Deeply lacinate-toothed. My thanks are due to Mr. Elworthy for fronds. No illustration is necessary.



Fig. 366.—Middle pinnæ.

LACINIATUM-DISSECTUM, *Moore*. (Fig. 366.)—An exceedingly beautiful dwarf variety, found in Newton Dale, near Whitby, Yorkshire, by Mr. Clapham, and near Levens by Mr. Barnes. The outline of the frond moderately irregular. Considerably irregular in the outline of the pinnæ. The pinnules somewhat less abbreviated, and more regularly laciniately dentate; the teeth bold, long, and narrow. The illustration is from Mr. Barnes' frond.



Fig. 367.—Pinnæ.

LACERATUM, *Moore*. (Fig. 367.)—This very narrow and much lacerated variety was found in Devonshire, by Mr. C. Jackson. Length of frond eighteen inches. Pinnæ brief, exceedingly irregular, mostly abrupt, and showing a disposition to branch at the apex. Pinnules in some places wanting, in others very large,

mostly irregularly oblong or ovate, profoundly pinnatifid or ramose, the alternate teeth narrow, spreading and giving a fimbriate appearance.



Fig. 368.—Apex.

Fig. 369.—Middle pinna.

LATIFOLIO-IMBRICATUM, *Lowe*. (Figs. 368 and 369.)—Raised from spores by myself in 1863. A handsome distinct variety, evidently a sport from *latifolium*. Fronds oblong-lanceolate. Pinnæ in sterile fronds crowded, in fertile fronds the basal half distant. Pinnules conspicuously brief-stalked almost to apex of frond, ovate, imbricated very regularly from the middle upwards; fringed with small teeth. Sori almost submarginal. Pinnules lobate. On either side of the rachides are small oval openings between each pinnule from the base to the pinnatifid apex.

Length eighteen inches, width three to four inches. A sub-variety raised from this form has the pinnæ very irregular in size, and occasionally branched near the apex, in other respects it is identical with *latifolio-imbricatum*.



Fig. 370.—Middle pinnæ.

LACINEATO-CONFLUENS, *Moore*. (Fig. 370.)—A narrow-fronded dwarf variety. Length of frond eight inches, width one inch and a half. A laciniated and confluent variety. The illustration is from Messrs. Stansfield, of Todmorden.

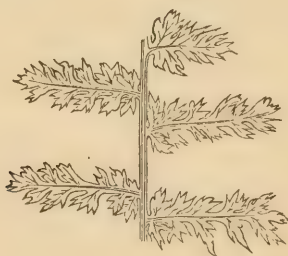


Fig. 371.—Pinnæ.

LACINEATO-LINEATUM, *Moore*. (Fig. 371.)—A dwarf very narrow-fronded bipinnate variety. Length of frond nine inches, width less than an inch. Pinnæ alternate, distant; lobes of the pinnæ laciniated, often minute, depauperate, or the dentation alone present. The illustration is from Messrs. Stansfield.



Fig. 372.—Portion of Frond.

LACINIATO-ELEGANS, *Clapham*. (Fig. 372.)—An elegant dwarf form of *laciniatum*, raised from spores by Mr. A. Clapham, of Scarborough. Dwarf, eight inches long, and two inches broad. Pinnæ unequal in size, but not enough to interfere with the general outline of the frond; somewhat lax. Pinnules varying considerably in size and form, mostly broad and short, some depauperated, others wanting, except the rudiments of the costa; much lacinated and decurrent; occasional fronds pinnatifid. The illustration is from Mr. P. Neill Fraser.



Fig. 373.—Middle pinnæ.

LACINIATO-INTERRUPTUM, *Clapham*. (Fig. 373.)—Another distinct slender form of *laciniatum*. Length of frond ten inches, width nearly three inches in the centre of the frond, diminishing rapidly towards the base. Basal pinnæ triangular-ovate, above

which pyramidal, sub-opposite below, alternate above; occasional fronds sub-opposite throughout; some of the pinnæ much depauperated, others wanting. Pinnules on the basal half of the frond, leafy and imbricate, above distinct, and divided to the costa; the abnormal pinnules various in size and form, and much lacinated. The illustration is from Mr. P. Neill Fraser's fronds.



Fig. 374.—Middle portion of Frond.

LACINEATO-TRUNCATUM, Moore. (Fig. 374.)—An interesting well-marked truncate form of *laciniatum*. Length of frond twelve or thirteen inches, width only two inches. Slender. Pinnæ distant on the lower half of the frond, and more approximate upwards, their apices ending abruptly in large dilated terminal pinnules. Pinnæ largest in the centre of the frond, being minute at the base and narrowing to the apex. Pinnules lacinate, and various in size and shape. The illustration is from Messrs. Stansfield.



Fig. 375.—Middle pinnæ.

LACINIATO-PADLEYI, Lowe. (Fig. 375.)—Found at Exeter by the Rev. Charles Padley, of Bulwell Hall. A charming

form, with fronds sixteen inches in length, and six inches in width in the widest part of the frond. A fragile delicate Fern. Pinnæ descending to the centre of the frond, and then slightly ascending to the apex, linear-oblong, acuminate, the upper ones irregular in size; alternate from the base to the tip of the frond. Pinnules usually large, broad, and much lacinated, the upper half of the frond very various in form, extraordinarily lacinated, depauperated, various in shape and size, sometimes wanting, and sometimes the apices of the pinnæ terminating in naked points. Sori very irregular, and very sparingly distributed over the under surface of the frond. I am indebted to Mr. Padley for the illustration.



Fig. 376.—Upper portion.



Fig. 377.—Lower pinna.

LAVEYANUM, *Ivery*. (Figs. 376 and 377.)—A remarkable Fern. Fronds twenty-eight inches long, and three inches and a half wide in the broadest part, and only half an inch wide for the eight inches next the apex. The lowest six inches destitute of pinnæ, for the next eight inches distant, then crowded and overlapping each other to the apex. From the centre of the frond upwards, the rachides branching abruptly into a cluster of three pinnules, the pinnules being deeply divided, various in form, and dentate. I am indebted to Mr. Ivery, of Dorking, for fronds.



Fig. 378.—Middle pinna.

LATUM, *Lowe*. (Fig. 378.)—Found at Dale Abbey in 1864. A very large-growing wide-fronded variety. Fronds three feet long. Pinnæ large, approximate; alternate, and acuminate. Pinnules large, brief stalked, dentate along their edges, and rounded at their apices. Sori small, but covering the whole frond, situated near the costa; about six pairs on each pinnule.



Fig. 379.—Middle pinna.

LAXUM, *Schumacher*. (Fig. 379.)—Found in Yorkshire by Mr. A. Clapham; Shrewsbury, by the Rev. W. A. Leighton; at Avening, in Gloucestershire, by Mrs. Campbell; at Chaigeley Manor, near Clitheroe, by myself; at Mayford, in Surrey, by Mr. T. Moore; at Tunbridge Wells, by Mrs. Delves; at Nettlecombe, Somersetshire, by Mr. C. Elworthy; at Parracombe, Devonshire, by the Rev. J. M. Chanter, and in other parts of Devonshire by the Rev. C. Padley. In Wales, at Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison, and at Ruthin, Denbighshire, by Mr. T. Pritchard. In Scotland, at Ardrishag, in Argyleshire, by Mr. T. Moore; in the Pass of the Trosachs, and Callender, in Perthshire, by Mr. T. Moore. In Ireland,

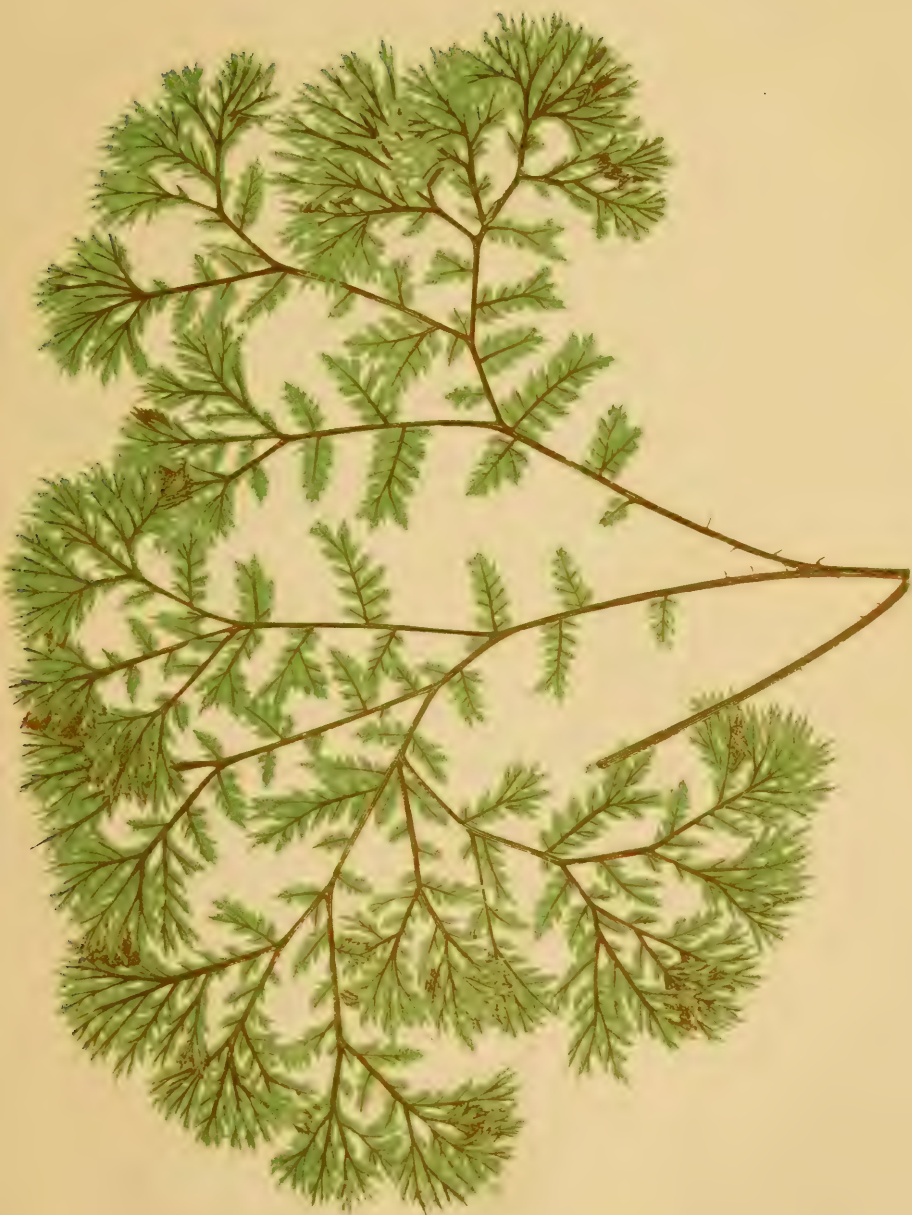
in the Valley of the Dargle, County Wicklow, by Mr. R. Barrington; at Killybegs, County Donegal; Glendalough, Connemara, and Kylemore, County Galway; Gweedore, County Donegal; Lough Gill, County Sligo; and in Mayo, at Slieve More, Island of Achil, by Mr. R. Barrington. In the Channel Islands, in Jersey by Mr. James, and in Guernsey by Mr. C. Jackson. A large-growing, broad, much-divided variety, more lax in habit than *incisum*. It is remarkable for the conspicuous elongation of the anterior basal lobe of the long narrow pinnules, these lobes forming a line on either side of the midrib. In these particulars it differs from *incisum*.



Fig. 380.—Frond reduced.

MESEMBRYANTHEMOIDES, *Clapham*. (Fig. 380.)—A very distinct, dwarf, multifid variety. Found by Mr. Clapham, of Scarborough. Fronds five to seven inches in length. The rachis dilated and flat on the upper portion, and throwing out branches, their rachides being also flat and dilated, and forming a compact very leafy crown. Below the dilatation there are several pairs of small normal pinnules, or sometimes branching pinnæ. For this desirable variety my thanks are due to Mr. P. Neill Fraser, of Edinburgh.

ACROCLADON, *Moore*. (Plate XXXVIII.)—This variety is worthy of the title of "Queen of Lady Ferns;" indeed its exquisite foliage is unequalled in the whole range of British botany, and, at the present time, it is at once the rarest and most remarkable of the British filices. Hitherto barren, plants have only been obtained by division, a slow process, which in eight years has not yielded as many plants. There is, therefore, no immediate likelihood that this much-coveted prize will become generally distributed. Indeed, so slowly has this charming Fern been increased, that the discoverer, Mr. C. Monkman, of Malton, has had to exercise seven years' patience before obtaining a specimen for his own collection. The original plant was found by Mr. Monkman growing by a road-side on the moor-track between Byland and Rivaux Abbeys, in Yorkshire. There were a few other Lady Ferns in company, all of which were quite normal; and, although various botanists have carefully searched the station many times, no second plant of *acrocladon* has been met with, nor has even a slight divergence from the normal form of *Athyrium* been found. The discoverer presented his plant to Mr. A. Clapham, of Scarborough, in whose possession it has since remained. In 1863 that gentleman could boast of a plant (the original one) fully two feet high, and as much in diameter,—a mass of the most exquisite foliage, to which no word-picture can ever do justice. When found the young seedling bore a general resemblance to the variety *crispum* or *Smithii*, but it was soon seen to be distinct, and with growth became entirely so. The fronds upon Mr. Clapham's plant have been two feet long, having no definite form. The rachis, stout at the base, divides near the crown, the divisions continuing to fork many times without any regularity whatever, forming a densely ramified mass of foliage. Although the variety *crispum* gives a good idea of the young state of *acrocladon*, the latter, when mature, does not possess any resemblance to the former. *Acrocladon*, indeed, is vigorous and erect in growth. The apices of the frondial divisions, and those of the irregular pinnæ, are all densely tasseled, or crested; and the pinnæ and pinnules are unsymmetrically erosely toothed. So far as Mr. Monkman has observed, the variety is barren. The illustration is from a frond contributed



by Mr. Clapham, who was erroneously stated (in the notice in "New and Rare Ferns") to have raised the original plant.



Fig. 381.—Middle of Frond.

MUCRONATUM, *Moore*. (Fig. 381.)—Another very narrow-fronded variety, ten inches in length, and half an inch wide, abruptly branching near the main rachis. Pinnæ various in size and form. Pinnules various. Dentation mucronate. Stipes red. My thanks are due to Mr. Ivery, for fronds.



Fig. 382.—Pinna.

MULTICEPS, *Moore*. (Fig. 382.)—This magnificent variety was found near Truro, in Cornwall, and was made public by Messrs. Veitch, of Exeter and Chelsea. *Multiceps* is of vigorous habit, the fronds being two feet in length. The fronds and pinnæ are multifid-crisped in a symmetrical manner like the variety *multifidum*, in addition to which they have the singular lacerate tassels of the variety *depauperatum*. Fronds broadly lanceolate, with a wide-spread, corymbosely-

tufted, terminal, crispy, five- or six-branched tassel, each branch many times dichotomously-divided. The tassels consist of lacerate, narrow divisions, everywhere fringed with small leafy lobes. The large tassel at the apex of the frond is as much as five inches wide. The pinnæ have at their base inciso-serrate, unequal, oblong pinnules; the pinnules becoming shorter towards the apex, and ultimately expanding into large, lacerate, many-times-divided, terminal tassels, forming a uniform border to the frond; the tassels on the pinnæ are in the largest one inch and a half long, being two inches in width.



Fig. 383.—Frond reduced.

MOOREI, *Lowe*. (Fig. 383.)—A dwarf multifid variety, found in the Channel Islands by Mr. James, of Vauvert. Length of frond eight inches, width two inches and a half. Pinnæ exceedingly irregular in size, varying from less than half an inch in length to one inch and a half, and one half absent. The apices of the larger pinnæ compactly multifid, the smaller ones only dilated. The apex of the frond dividing into four multifid branches, and forming a wide *corymbiferous* head.

Pinnules ovate-oblong, split to the rachides, and minutely dentate. My thanks are due to Mr. Moore for fronds.

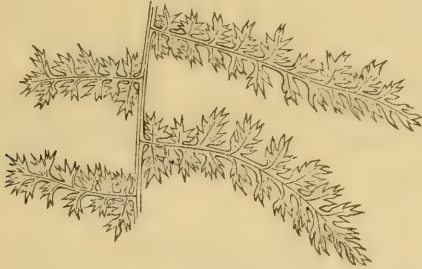


Fig. 384.—Portion of Frond.

MULTICUSPIS, *Barnes, MSS.* (Fig. 384.)—Found in 1860 near Levens by Mr. Barnes. A slender narrow-fronded variety, thirteen inches in length, and two inches and a half to three inches wide. A remarkable laciniated form. The four basal pinnæ very small and brief, then very various in size, becoming irregularly small near the apex, distant and opposite below, and alternate and by no means approximate above. Pinnæ narrow, and the basal side much the longest pinnuled. Pinnules various in size and form, some wanting all but a dentated fragment, mostly unequally cut and multicrisped. My thanks are due to Mr. Barnes for fronds.



Fig. 385.—Pinna.

MULTIFURCATUM, *Moore.* (Fig. 385.)—Another multifid form of the type *incisum*, exceedingly handsome and vigorous in

habit. Found in the Mountain of Voil Famma, near Ruthin, Denbighshire, by Mr. T. Pritchard. The characteristic difference from *incisum* consists in the apices of the pinnæ being singularly multifid, as well as the apex of the frond; forming a brief terminal expanded tuft, merging into those of the pinnæ. The pinnæ narrow in some degree towards the multifid apex, whilst the apices of the pinnæ expand into a number of flat-spreading nearly recurving segments, extending into lengthy points.



Fig. 386.—Middle pinnæ.

PANNOSUM, *Moore*. (Fig. 386.)—Found at Nettlecombe, Somersetshire, by Mr. C. Elworthy; at Whitby, Yorkshire, by Mr. W. Willison; Todmorden, Lancashire, by Mr. A. Stansfield; Lowestoft, Suffolk, by Mrs. Walker; Hovingham, Yorkshire, by Mr. C. Monkman; and at Virginia Water, Surrey, by Dr. Allchin. A somewhat slender variety of moderate size. Fronds lanceolate, pinnæ irregular in outline, and tapering to a point. Pinnules irregularly pyramidal, somewhat decurrent, profoundly pinnatifid, the lobes unequal and disproportioned, and the teeth variously shaped. Fronds have been sent by Mr. C. Elworthy, of Nettlecombe.



Fig. 387.—Portion of Frond.

PANNOSUM-NANUM, *Moore*. (Fig. 387.)—An interesting dwarf form. Length of frond nine or ten inches, width three inches

and a half. Pinnæ ascending. Pinnules pyramidal; teeth regular, and mostly bidentate. Colour vivid green. The illustration is from Messrs. Stansfield.



Fig. 388.—Middle pinna.

PARSONSÆ, *Moore*. (Fig. 388.)—An exceedingly handsome lax variety, found in Staffordshire by Miss Parsons. The two or three basal pairs of pinnæ very short and descending, the others becoming longer to the centre of the frond, and then diminishing again, distant and flexuous, longest pinnæ three inches and a half in length, and very narrow. Pinnules also lax, narrow, and bidentate. Length of frond fifteen inches, width seven inches. Sori conspicuous and confluent, entirely covering the under side of the frond. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, for fronds.



Fig. 389.—Pinna.

PARVICEPS, *Barnes, MSS.* (Fig. 389.)—A charming small variety, found by Mr. Barnes, of Levens Castle; at Arncliffe Tower. Length of frond twelve inches, width in centre of frond three inches and a half. Pinnæ ascending except the three basal pairs, which are descending; equal in width except near the apex, where slightly contracted, then furcate into a diminutive multifid distinct apex, the furcations branched into flat dentate lobes. Bipinnate. Pinnæ very

symmetrical, diminishing rapidly near the apex and in the two basal pairs. Pinnules also symmetrical, profoundly and evenly dentate. The apex of the frond terminating into a flat fan-like multifid tuft. Sori abundant. Stipes scaly. For fronds of this interesting slender variety I am indebted to Mr. Barnes.



Fig. 390.—Pinna.

PLUMOSUM-JERVISII, *Lowe*. (Fig. 390.)—An exceedingly handsome variety, in the possession of Mr. Swynfen Jervis, of Darlaston Hall, near Stone, Staffordshire. Large size, noble looking, pinnae symmetrical, close, pinnules symmetrical and close. A much-cut, broad-fronded, and very feathery-looking Fern. I am indebted to Mr. Swynfen Jervis for the illustration.



Fig. 391 —Pinna.

PLUMOSUM-BARNESII, *Wollaston*. (Fig. 391.)—This beautiful variety is perfectly barren, probably analogous to *incisum*, *Polypodium vulgare*, var. *Cambricum*, etc. It was found in

1862 near Milnthorpe Station by Mr. Barnes. It differs from *plumosum* in the more distant pinnæ, and the exquisite feather-like character. The segments of the pinnules are very narrow, and deeply cut, being decurrent on the costa, and their divisions again deeply and finely cut. The superior basal pinnule and superior basal lobe considerably larger than the rest. A large-growing delicate-looking variety. I am indebted to Mr. Barnes for fronds.



Fig. 392.—Middle pinna.

PLUMOSUM-STANSFIELDII, *Lowe*. (Fig. 392.)—Another plumose form of very thin substance, found by Mr. Stansfield, near Todmorden. The fronds blunt at the apex. Pinnæ broad and pyramidal. Pinnules large, divided at the base to the costa, much cut, the lobes being dentate on their edges, but very leafy, the tips of the pinnæ overlapping. The illustration is from Mr. Stansfield. A splendid form of this variety has been found at Honiton by Miss C. E. Johns, in which the frond is fifty-four inches long, and the pinnæ nine inches.



Fig. 393.—Pinna.

PRUINOSUM, *Moore*. (Fig. 393.)—Found at Tarbet, in Dum-
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bartonshire, in 1855, by Mr. Thomas Moore, of Chelsea. Stipes red, and covered, as well as the rachides, with small glands, giving the fronds a hoary appearance, not unlike a pubescence. This variety bears resemblance to *trifidum*, having linear-oblong approximate pinnules. Length sixteen inches; width four inches and a half. Pinnæ distant below. Somewhat similar varieties have been found in the Isle of Man, and at Virginia Water, Surrey, by Dr. Allchin. My thanks are due to Mr. P. Neill Fraser, of Edinburgh, for fronds.



Fig. 394.—Middle pinna.

POLYDACTYLON, Moore. (Fig. 394.)—Found near Nettlecombe, in Somersetshire, by Mr. C. Elworthy, and subsequently nearly similar forms found at Whitby, Yorkshire, by Mr. W. Willison; Tunbridge Wells, Kent, by Mrs. Delves; at Barnstaple, Devonshire, by Mr. C. Jackson; and at Windermere by Mr. F. Clowes. This variety belongs to the *incisum* type, and is a monstrous form whose fronds have been found to perish in the autumn six weeks sooner than the variety *multifidum*. It is both beautiful and ornamental in its form and habit. The distinctive character of this charming Fern consists in the apices of the pinnæ being furcately divided into five or six normal-looking points, being plane (not crisped.) The apex of the frond is also two or three times forked. The fronds are lanceolate, symmetrical, and eighteen or twenty inches in length. The pinnæ distant below, oblong, and scarcely narrowed below the three- or five-fingered termination to each pinna. Pinnules oblong-lanceolate and pinnatifid in a normal manner.



Fig. 395.—Upper pinna.

PURPUREUM, *Hort.* (Fig. 395).—Length of frond thirty inches, of which ten inches is the stipes; width eleven inches. Lanceolate in form. Pinnæ distant below, approximate upwards, the basal pinnæ nearly three inches apart, in the centre of the frond only an inch. The lower pinnæ flexuose, the upper slightly ascending; length five inches and a half, width one inch and a half. The larger pinnules three quarters of an inch long, deeply divided, and auriculate. Pinnules stipitate. Sori copious, lunulate, and small. Rachis and stipes of a purplish red colour. Found at Osmaston Manor, near Ashbourne, in great abundance. I am indebted to Mr. Monkman, of Malton, and to Mr. Wright, of Osmaston Manor, for fronds.

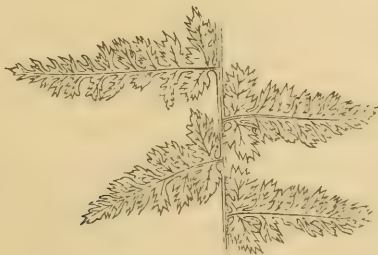


Fig. 396.—Middle portion.

PYGMÆUM, *Moore.* (Fig. 396).—A dwarf variety. Length of frond seven inches. The pinnules variously lacinated and depauperated, the anterior basal pinnule much longer than the others. Not unlike *laciniato-confuens*, and not sufficiently

distinct, at least as regard all the fronds I have seen. The illustration is from Messrs. Stansfield.



Fig. 397.—Shewing form of Frond.

Fig. 398.—Middle pinna.

Fig. 399.—Middle of lower portion.

RAMO-DEPAUPERATUM, *Monkman, MSS.* (Figs. 397, 398, and 399.)—Found by Mr. Monkman in Yorkshire. Stipes and rachis purple. Fronds slender, and of thin substance. Length eighteen inches, becoming twin-branched or even triple-branched at four inches above the caudex. Pinnæ in the basal half of each frond depauperate, and occasionally so in the upper portion, their apices acuminate, often dilate and furcate. Pinnules stalked, pyramidal, divided to the costa with sharp-pointed very narrow teeth. The abnormal pinnules very various in form. My thanks are due to Mr. Monkman, of Malton, for fronds.

RAMULOSO-MONKMANII, *Lowe.*—This variety differs considerably from the *ramulosum* found at Windermere, by Mr. F. Clowes. Mr. Clowes' variety is large, stout, and broad, namely, twenty inches long, by nine inches and a half broad, dividing into two fronds eight inches below the apex, and then

dividing again and again several times. The apices of the pinnæ are drawn out into lengthy points, and now and then one is furcate: the width across the apex of the frond is eight inches. The pinnules are deeply divided and coarsely-dentate, and are linear-oblong. *Ramuloso-Monkmanii* on the contrary is slender, thin, and much narrower, being fifteen inches long, and six inches broad. Pinnæ broad and short pointed, the apex of the frond terminating one inch and a half below the tip in a brief, very leafy, much-branched crown, of two inches and a half in diameter. Pinnules crowded, broad and entire, oblong-ovate, rounded at their apices, and merely fringed with minute teeth on their margin. Sori situated close to the costa. My thanks are due to Mr. Monkman for fronds. An illustration is unnecessary.



Fig. 400.—Middle pinna.

RAMO-CRISTATUM, Sim. (Fig. 400.)—An exceedingly handsome multifid variety. Frond eighteen inches long and ten inches wide, nearly equal in width, except near the base, and but little diminished at the apex, where it branches. The apices of all the pinnæ are extensively multifid, the crests being from an inch and a half to two inches across, and the pinnae of the branching apex also multifid or furcate. Pinnæ opposite, nearly equal in width from the base to the wide-spreading tassel. Pinnules long, narrow, rounded or dilated at their apices, the dentation recurved. I am indebted to the Rev. Charles Padley, of Beaconfield, near Plymouth, for fronds.

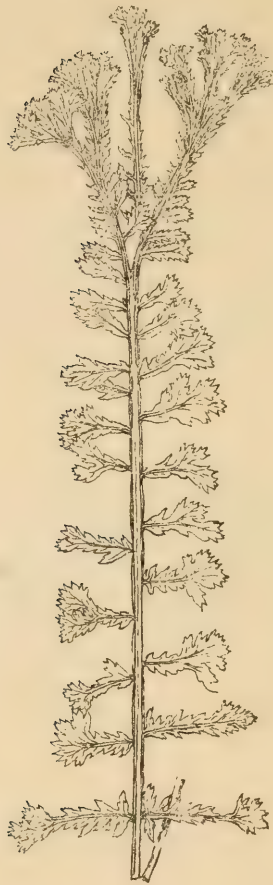


Fig. 401.—Frond.

RAMOSUM, *Wollaston*. (Fig. 401.)—A dwarf depauperatum-looking Fern, six inches in length. Pinnæ small, their apices crested, mostly the pinnules decurrent except the two basal ones which are even-stalked, the decurrent portion being a double row of teeth without any further development. The crested apices more or less entire with a dentate edge. The apex of the frond ramose, and the branches multifid. My thanks are due to Mr. Monkman, of Malton, for fronds.



Fig. 402.—Middle pinna.

STENODON, *Moore*. Fig. 402.)—Found at Gomshall, Surrey, by Mr. E. Morse; at Ilfracombe, Devonshire, by the Rev. J. M. Chanter; and at Scarborough by Mr. A. Clapham. A handsome somewhat dwarf variety; length of frond from twelve to eighteen inches. The fronds lanceolate. Pinnæ right-angled oblong-acuminate. Pinnules approximate, linear-oblong, unequal, blunt, united by a narrow wing along the rachis; pinnatifid below with toothed lobes, and simply toothed above; teeth narrow and long. Rachis thick, and pale dull red in colour. I am indebted to Mr. Thomas Moore, of the Chelsea Botanic Gardens, for fronds.



Fig. 403.—Apex.

Fig. 404.—Middle pinna.

SUBDIGITATUM, *Moore*. (Figs. 403 and 404.)—Found in

1861 near Burneside by Mr. A. B. Taylor. Stipes and rachis strong. Length of frond fourteen inches. Pinnæ distant below, approximate above, broad, and some multifid at their tips, especially towards the apex of the frond. Pinnules long, narrow, and rounded at their apices, finely and regularly dentate, more dilated near the base of the frond, and the inferior pinnules longest. Pinnæ rapidly contracting in size, and the frond terminating in a multifid apex. My thanks are due to Mr. Barnes, of Milnthorpe, for fronds.



Fig. 405.—Middle pinna.

SUBCRUCIFORME, *Wollaston*. (Fig. 405.)—Found in 1861 near Whitbarrow, by Mr. Barnes. A large-growing but delicate-fronded Fern, remarkable for the almost cruciform shape of a portion of the pinnules. The pinnæ are long, narrow, and pointed, the outline of the frond being symmetrical; the pinnules however vary in an extraordinary degree, the inferior pinnules much longer, and more frequently normal than the inferior ones. Some pinnules are of the form of a cross, others branching, forked, or more or less depauperated. Only about one half of the fronds are properly marked, the rest being normal. The illustration is from Mr. Barnes' fronds.



Fig. 406.—Pinna.

TENUE, *Moore*. (Fig. 406.)—Found at Scarborough by Mr. Clapham, and has proved constant in cultivation. A slender

drooping form, and of medium size. Length of frond twelve to eighteen inches. Broadly lanceolate and bipinnate. The pinnæ are distant and caudately acuminate. The pinnules distant, pinnatifid, narrow-oblong, and blunt. Lobes shallow and short-toothed, the apical teeth also diminutive. The basal pinnules are situated close to the main rachis, making the pinnæ quite sessile. Another slender form, not unlike this in having a lax habit, in being sessile, in having caudate pinnæ, and narrow distant pinnules, has been found at Todmorden by Mr. Stansfield. In the Todmorden plant the pinnules are unequal in length, and the teeth are unusually large.

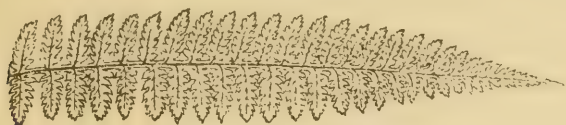


Fig. 407.—Pinna.

TRIFIDUM, Moore. (Fig. 407.)—A slender, narrow variety. Length of frond twenty-eight inches, of which one half is the stipes. Width five inches in the broadest part. Pinnæ linear-lanceolate, acuminate, distant below, and not crowded above. Pinnules oblong-ovate, their apices rounded, divided to the costa, except near the apex, where pinnatifid, dentate. Found at Mayford, in August, 1861, by Mr. Thomas Moore, of the Chelsea Botanic Gardens. The illustration is from Mr. P. Neill Fraser, of Edinburgh.



Fig. 408 —Pinna.

THYSSANOTUM, Moore. (Fig. 408.)—Found in the Island of Guernsey by Mr. James, of Vauvert. An exceedingly handsome,

tasseled variety, of vigorous habit and symmetrical form. Length of frond twenty-four to thirty inches. Lanceolate. The tips of both the fronds and the pinnæ expanding into crispy tasseled tufts. The pinnæ oblong in form, scarcely contracted below the tufts. Pinnules also oblong, flat, frequently dilated at their apices, pinnatifid; the lobes toothed. Mr. Moore remarks this is a handsome variety, superior to the well-known and justly-admired *multifidum*, as the fronds do not become curled as in that variety. For fronds I am indebted to Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire; Mr. C. Elworthy, of Nettlecombe; Mr. Sim, of Foot's Cray; Mr. E. Cooling, of Mile-ash Nursery, near Derby; Messrs. Stansfield, of Todmorden; Mr. Kennedy, of Covent Garden; the Rev. C. Padley, of Beaconfield, near Plymouth; and to Mr. James, of Vauvert.

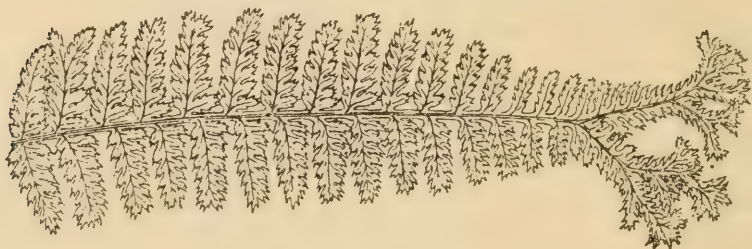


Fig. 409.—Middle pinna.

TRIDENTATO-MULTIFIDUM, *Lowe*. (Fig. 409.)—An exceedingly handsome multifid variety, raised from spores by Mr. James, of Vauvert, Channel Islands. Fronds eighteen to twenty inches in length, eight inches in width in the widest part; regular in outline, being widest in the middle and narrowing rapidly to the apex and more gradually towards the base. Pinnæ ascending, opposite in the three basal pairs, subopposite in the next six pairs, alternate in the next four pairs, and subopposite again near the apex. Linear oblong, the longest five inches, substance thin, apex furcate, and the furcations multifid, pinnæ lax below, and approximate in the middle of the frond. Pinnules large, their apices overlapping in the centre of the frond, broad and profoundly cut, dilated at the apex. Lobes mostly tridentate, some even quadridentate, and even near the apex of the frond bidentate. Sori lunulate, situated close to

the costa, at the base of each lobe, and forming a row on either side of the costa, mostly six or seven pairs. Every lobe from the base to the apex of the frond soriferous. Stipes and rachis purplish, and slightly scaly. The illustration is from Mr. James' frond.



Fig. 410.—Pinna.

TORTILE, *Moore*. (Fig. 410.)—A very curious variety found at Skipworth, Yorkshire, by Mr. Stansfield. General outline of the frond normal. Pinnæ somewhat unequal in length and their apices often twisted. Pinnules rather distant and more or less variously and irregularly distorted, so as to make the frond greatly irregular, occasionally oblong and pinnatifid with unequal lobes, mostly shortened or narrowed, or curved, the the opposite sides being unlike.



Fig. 411.—Middle pinna.

UNCUM, *Moore*. (Fig. 411.)—Found in 1860 in Levens Park, by Mr. Barnes. A slender fragile Fern, of ten inches in length, and three inches in width in the widest part. Pinnæ delicate, narrow, distant, about fifteen pairs. Pinnules varied in form, although of general similarity; dentation distant, divided to the costa, decurrent, standing out prominently in various grotesque directions, often bent back like a hook, hence its name. Sori situated near the costa at the base of the denticulations, and therefore on the edge, so as to make them partly suprasoriferous.

A most interesting variety. My thanks are due to Mr. Barnes, of Milnthorpe, for fronds.



Fig. 412.—Middle pinna.

UNDULATUM, *Moore*. (Fig. 412.)—Found in Guernsey, by Mr. J. James, of Vauvert. A large broad form of the incisum class. Stipes and rachis red. The fronds, exclusive of the stipes, fourteen inches long and eight inches broad. Pinnæ flexuose, broad, somewhat irregular, crowded, their apices acuminate. Pinnules lanceolate, acute, almost pinnate, stalked, crowded, and very leafy. Lobes somewhat wavy on their edges. Sori minute, situated near the costa. The illustration is from Mr. James' frond.



Fig. 413.—Middle of Frond.



Fig. 414.—Middle of Frond.

VARIABLE, *Moore*. (Figs. 413 and 414.)—Found in 1861 near Levens, by Mr. Barnes. A dwarf slender variety, with

fronds from nine to ten inches in length, and two inches in width. As its name implies, it is exceedingly variable in its character. Pinnæ short and broad, being frequently but little divided, and as frequently quite divided, pointed, or flattened, branched, or furcate. Pinnules very variable in size and form, some as well as some pinnæ depauperated or wanting. Two dissimilar fronds will illustrate how various are the features. The illustrations are from Mr. Barnes' fronds.



Fig. 415.—Middle pinnae.

VARIABLE-JERVISII, *Jervis*. (Fig. 415.)—A dwarf narrow-fronded lacinated variety, with very variously-formed fronds; the pinnæ and pinnules, and especially the latter, variously depauperated, lacinated, and sometimes almost wanting. Length of frond nine inches, width in centre two inches and a quarter, narrow at the base, and acuminate at the apex. My thanks are due to Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, for fronds.



Fig. 416.—Pinnae.

VERNONIÆ, *Jervis*. (Fig. 416.)—An interesting distinct variety, the divisions of the fronds having a frilled character, as in *conioides* and *latifolium*. Found by Miss Vernon, and

named by Mr. Swynfen Jervis, of Darlaston Hall, the fortunate possessor of this charming form. Length of frond eighteen inches, width four inches and a half. Pinnæ narrowing from the centre of the fronds to the base. Pinnæ distant below, and approximate near the apex. Pinnules briefly stalked, broad and leafy in the lower half of the frond, deeply cut, narrower and much more lacinated towards the apex of the frond. The apices of the upper half of the frond abruptly terminating in a long sharp point, almost microscopically dentate. I am indebted to Mr. Swynfen Jervis, of Darlaston Hall, and to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 417.—Pinna.

ELWORTHII-SPLENDENS, *Lowe*. (Fig. 417.)—An interesting multifid form, found near Nettlecombe by Mr. Elworthy. Pinnæ narrowing to their compact, rounded, multifid apices. Pinnules sharply dentate, and dilated (often bifid) at their apices. My thanks are due to Mr. Elworthy for fronds.

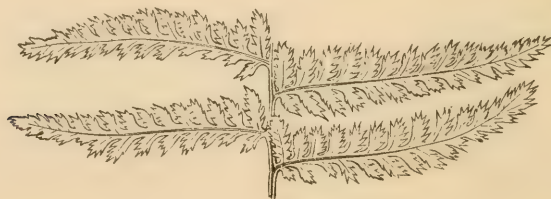


Fig. 418.—Middle pinnæ.

PADLEYI, *Lowe*. (Fig. 418.)—A distinct form of the Lady Fern, found in Ireland by the Rev. Charles Padley, of Beacon-

field, near Plymouth. Fronds long and narrow. Pinnæ alternate, narrow, the tips blunt. The inferior pinnules mostly minute and decurrent, the superior ones deeply divided and sharply serrate. The superior basal pinnule longer than the others. I am indebted to the Rev. C. Padley for fronds.



Fig. 419.—Shewing form of Frond.



Fig. 420.—Middle portion.

WILLISONII, *Willison*. (Figs. 419 and 420.)—An extraordinary looking dwarf distorted variety, found near Whitby by Mr. Willison, a nurseryman of that town. Length of frond ten inches and a half, of which seven inches is the stipes, and only three inches the leafy portion of the frond, the leafy portion being as wide as it is long. Stipes very scaly at the base, with large reddish brown scales. Immediately below

the basal pinnæ the rachis becomes flattened out and distorted in an extraordinary degree, and this distortion continues to the apex of the frond. The pinnæ and even the pinnules branching in various ways, no two being alike. The lobes are narrow-laciniate and dentate. For this distinct form I am indebted to Mr. Willison.



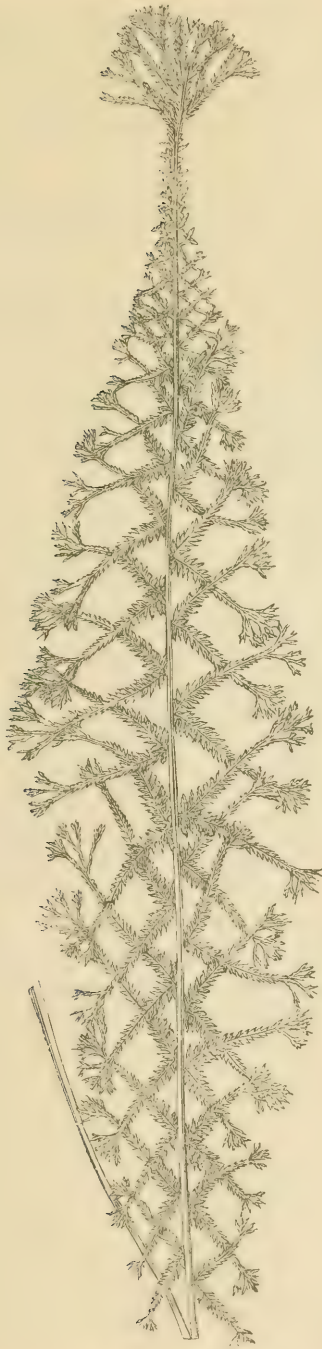
Fig. 421.—Middle pinnæ.

CONFLUENS MINOR, *Lowe*. (Fig. 421.)—This interesting variety was raised from spores in the Fernery at Highfield House. Dwarf in habit. Pinnæ distant, broad, short, the pinnules crowded and overlapping, the basal ones much larger than the others. Sharply dentate. Frond symmetrical in form.



Fig. 422.—Apex.

SINGULARE, *Lowe*. (Fig. 422.)—A singular variety, found near Nettlecombe by Mr. C. Elworthy. The fronds are usually



minus the ultimate pinnæ. The pinnules are variable in size and form, sometimes wanting, more frequently depauperated, and grotesque in shape. The upper half of the pinnæ more or less decurrent. I am indebted to Mr. Elworthy for fronds.

VICTORIÆ, *Moore*. (Fig. 423.)—This Queen of Ferns was accidentally discovered by Mr. James Cosh, while on a botanical ramble in the year 1861, by the side of a bye-way that runs along the margin of a wood on the Buchanan estate, Stirlingshire, the property of His Grace the Duke of Montrose. Being a large plant it attracted the attention of Mr. Cosh, who however allowed it to remain in its original situation till the summer of 1863, when Mr. John Connon, the gardener at Buchanan, having had his attention drawn to this curious Fern, and being aware of how great an acquisition it was, had it transferred to the garden. Mr. Moore gave it the name of *Victoriæ*, considering it worthy of that high distinction, and the editor of the "West of Scotland Horticultural Magazine" fully described it in May, 1864. The original plant is still at Buchanan; but by some means, not altogether legitimate, a portion of this plant got into other hands. Length of frond eighteen inches, width five inches. The pinnæ, which average three inches in length, in the centre of the frond are branched. The secondary rachis divides close to the junction with the main rachis into twin pinnæ, one of which ascends at an angle of about 50° , and the other descends at the same angle; therefore each ascending pinna crosses the next two descending pinnæ, and *vice versa*, thus forming a number of diamond-shaped spaces. The pinnæ are linear, and an inch below their apices divide into three or four linear branches, which are multifid-crested. The pinnæ are slightly shorter towards the base, and gradually diminish in length towards the apex of the frond, which is also digitately multifid. Two inches below the multifid apex of the frond the pinnæ become very small, and are not branched at their tips. Pinnæ sub-opposite below, alternate above. Pinnules small and entire, divided to the rachides for half the length of the pinnæ, and then decurrent to the apex, being merely a row of small teeth on either side of the rachides. Mr. John Sadler has described this variety in the "Bot. Soc. Edin. Trans.," vol.

viii, p. 187. This variety he thus describes:—"In February, 1863, while at Alloa, I obtained from Mr. Dawson and Mr. Paterson, dried fronds of a singularly beautiful variety of *Athyrium Filix-fœmina*, a living plant of which I now exhibit. I was informed that it had been collected in 1862 by a young gentleman, Mr. James Cosh, in a wild state by a roadside in Stirlingshire, near Loch Lomond, and on the estate of Buchanan. In the spring of last year I sowed a few of the spores, some of which germinated, and are now mostly thriving young plants, but as yet shewing no marked symptoms of their parent's peculiarity. As I could find no description in Moore's 'British Ferns' answering to my plant, I transmitted the fronds to that gentleman, when he wrote me as follows:—"The variety of *Filix-fœmina* is quite new, so far as I know, and is a very beautiful one. As a queen amongst Lady Ferns it would well bear to be called *Victoriæ*.' Accordingly it is published under this name in Mr. Fraser's List of British Ferns and their Varieties, recently issued. The fronds are from ten to eighteen inches in length, and crested at the apex. The pinnæ are also crested, and, instead of being single as in all the other varieties, they leave the rachis in pairs, and at such an angle, that each alternate pair overlaps the other so as to give a beautiful plaited appearance to the whole fronds." For fronds I am indebted to Professor Balfour, of Edinburgh; Mr. Sadler, of Edinburgh; Mr. P. Neill Fraser, of Cannonmills Lodge, Edinburgh; and to Mr. John Connon, of the Buchanan Gardens.



Fig. 424.—Middle pinna.

REFLEXUM, *Clapham*. (Fig. 424.)—Found near Scarborough, in October, 1864, by Mr. A. Clapham. A slender, dwarf, narrow-fronded, distinct variety. Length eleven inches, width varying from two to three inches. Pinnæ approximate; pinnales distant and reflexed. Copiously soriferous.



Fig. 425.—Middle pinna.

IMBRICATUM, *Clapham*. (Fig. 425.)—Gathered in August, 1863, rather abundantly at Ilkley, by Mr. A. Clapham, of Scarborough. An interesting imbricated variety, eighteen inches in length. Fronds narrow at the base, gradually widening, becoming widest beyond the centre of the frond. Sori most abundant, covering the whole under side of the segments, with a densely thick confluent mass, and from the segments curling over, shewing on the opposite side so as to become suprasoriferous. Stipes naked for five inches, then the sub-opposite pinnæ distant, becoming approximate and alternate above. I am indebted to Mr. Clapham for fronds.



Fig. 426.—Middle pinna.

PHYLLOIDEUM, *Lowc*. (Fig. 426.)—An interesting variety raised from spores at Highfield House by myself. Length twenty inches, width nine inches in the widest part, becoming narrower to the base and apex, acuminate at the apex. Pinnæ in centre of the frond five inches long and one inch and a half broad, their apices acuminate. Pinnules very leafy, blunt-

pointed, and auriculate. Segments bi- and tri-dentate. Superior basal pinnules much longer than the others. Sori large, conspicuous, and eventually confluent.



Fig. 427.—Middle pinnae.

Fig. 428.—Basal portion.

LACINIATO-POLYMORPHUM, *Clapham*. (Figs. 427 and 428.)—Gathered in Onchan Bay, Isle of Man, in July, 1864, by Mr. A. Clapham, of Scarborough. Fronds very various, some broad and of a normal plumose character, not unlike those of the Male Fern; others very much altered in form and width, some only changed at the apex, others branching and furcate on the one side of the rachis and very brief on the other side, some branching near the base and others near the apex, whilst others are remarkably contracted, being scarcely one inch and a half wide in a frond of twelve inches in length. It is scarcely possible to describe this variety, as it varies in so extraordinary a degree in all parts of the fronds, and in one frond from another. Usual length fifteen inches. Mr. A. Clapham has obligingly forwarded a series of fronds.

PYRAMIDALE, *Moore*.—Found in Devonshire by the Rev. J. M. Chanter, and at Tunbridge Wells by Mrs. Delves. Allied to *laxum*, having broader pinnules, which exceed an inch in length, tapering to an acute point in a pyramidal manner. Lobes deeply separated.



Fig. 429.

LACINIATO-LACERATUM, *Clapham*. (Fig. 429).—Gathered near Harrogate, in 1859, by Mr. A. Clapham, of Scarborough. A large-growing narrow-fronded form. Length three feet, usual width less than six inches. A singular and handsome lacerate form of *laciniatum*, densely soriferous. Pinnæ and pinnules very various, no two alike, varying from one to five inches in length, mostly furcate or fan-shaped at their apices. I am indebted to Mr. Clapham for fronds.

COLPODES, *Moore*.—Found by Mr. G. B. Wollaston. Length eighteen inches, breadth five inches. Symmetrically lanceolate. Pinnæ distinct, broad, and acute, and some branched towards the end. Pinnules distinct, ovate-oblong, profoundly-pinnatifid. The distinct character is in the lobes curving towards the apex of the pinnule, forming a very open sinus. Lobes acutely toothed.

DECURRENS, *Moore*.—Found near Conistone, in the Lake District, by Mr. G. B. Wollaston. Length from twelve to eighteen inches. Lanceolate in form. Pinnæ rather narrowed towards the apex, which however ends abruptly and irregularly, as if the tip had been cut off. Pinnules distant, sessile, and decurrent, linear-oblong, pinnatifid; teeth not conspicuous. The frond seeming as if nibbled all over.



Fig. 430.—Pinna.

SUB-EROSUM, *Moore*. (Fig. 430.)—An interesting sub-erose variety, with fronds about fourteen inches long, and four inches broad in the centre. Alternate pinnæ. A portion only of the pinnules erose. I am indebted to Mr. P. Neill Fraser, of Cannonmills Lodge, Edinburgh, for a plant of this variety.

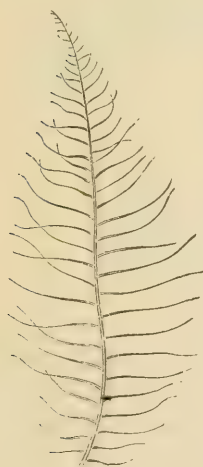


Fig. 431.—Shewing form of Frond.



Fig. 432.—Centre portion.

EDWARDSII, *Lowe*. (Figs. 431 and 432.)—A dwarf distinct variety, in the possession of Mr. Edwards, Nurseryman, Nuttall. Compact in habit, making a handsome specimen. Length of frond eight to ten inches, width two inches and a half. Pinnæ crowded, tapering both towards the base and apex; descending at the base, and ascending towards the apex. Pinnules overlapping, ovate-oblong. The frond has a tiled and crimped appearance. Sori situated in a single row near the costa. Some

years ago Mrs. Riley, of Papplewick, Nottinghamshire, had a variety almost identical with the present form. For fronds I am indebted to Mr. Edwards, of Nuttall.



Fig. 433.—Middle pinna.



Fig. 434.—Lower portion.

MONENSE, Clapham. (Figs. 433 and 434).—Gathered in the Isle of Man, in July, 1864, by Mr. A. Clapham, of Scarborough. A singular form, with various fronds of about twenty inches in length, some broad, others narrow, the upper half considerably contracted, or only contracted at the apex. Pinnæ usually much contracted near their apices, and then dilated at their extreme ends, occasionally widest at the apex. Pinnules simple, much cut, and the teeth very grotesque, some wanting, others minute. The illustrations are from Mr. Clapham, of Scarborough.

LONGRIDGENSE, Lowe.—A large-growing upright form found at the side of Longridge Fell, near Chaigeley Manor, Lancashire, by myself, on the 12th. of August, 1865. Length of frond four feet, width nine inches. The peculiarity consists in all the segments of the pinnules curling over, and almost

hiding the spore-cases, but differing from *rhæticum* in habit and in the form of the frond. An illustration is unnecessary.



Fig. 435.—Pinnae.

VERNONIÆ-CRISTATA, *Clapham*. (Fig. 435.)—In the possession of Mr. Clapham, of Scarborough, who received it accidentally from Messrs. Stansfield, of Todmorden. Length eight inches. A form of *Vernoniæ* with the apex of the frond and pinnæ cristate. My thanks are due to Mr. Clapham, of Scarborough, for fronds.



Fig. 436.—Pinna.

UNCUM-RAMOSUM *Lowe*. (*Uncum?* *Clapham*.) (Fig. 436.)—A seedling raised by Messrs. Stansfield, of Todmorden, and now in the possession of Mr. Clapham, of Scarborough. An interesting variety, with fronds from fourteen to seventeen inches in length. Fronds widest in the centre, narrowing to the base and apex. The apex branched. Pinnæ opposite at the base and alternate above, approximate, descending at a considerable angle below, and horizontal above the four basal pairs of pinnæ about an inch in length, the centre pinnæ four inches in length, their apices dilated, furcated, or branched. Pinnules distant, alternate, very leafy, and usually bidentate. A slender form. I am indebted to Mr. Clapham for fronds.



Fig. 437.—Frond.

TENUIFOLIUM, *Clapham*. (Fig. 437.)—Found in 1865 in Mr. Barnes' Nursery, Thirsk, and now in the possession of Mr. A. Clapham, of Ramsdale Bank, Scarborough. A very elegant and distinct Fern, at present about eight inches in length, and three inches in width in the widest part. Pinnæ irregular and almost wanting at the base, and wide in the centre of the frond, and the frond itself terminating somewhat abruptly. Pinnules linear or linear-oblong. The dentation very sharp-pointed. A thin slender form, likely to become even more distinct when of large size. My thanks are due to Mr. Clapham for fronds.

OVATUM, *Roth*.—Found at Virginia Water, Surrey, by Mr. Allchin; at Mayford by Mr. Thomas Moore; at Ruthin, in Denbighshire, by Mr. T. Pritchard; and at Tarbet, in Dum-

bartonshire, by Mr. T. Moore. Fronds somewhat lax and broadly-lanceolate in form, being thirty inches in length. Pinnæ somewhat distant, linear-oblong, and acuminate. Pinnules brief, ovate-oblong, distinct, broad at the base, with a narrow attachment; the tips narrowed, but blunt. Not conspicuously divided. Teeth short and blunt. Sori in two lines near the midrib. This variety is not so much divided, and has broader pinnules than *incisum*.



Fig. 438.—Portion of pinna.

ABASIPHYLLUM, *Lowe*. (Fig. 438.)—Length two feet. A slender interesting form, named *abasiphyllum* on account of the absence of the leafy part of the superior (sometimes both) basal segments of the pinnules. Found in 1863, at Ilfracombe, by Mrs. Thompson, of South Lawn, Exeter. Pinnæ and apex of the frond flexuose, pinnæ approximate. Pinnules leafy, simple, but deeply cut, the segments broad and dentate. The basal superior (and sometimes the inferior) segment of nearly all the pinnules all but absent, there being no leafy portion; a brief stalk, terminating in a sorus, which, being at the extreme end, is also suprasoriferous. The sori situated close to the costa, and oval in form. My thanks are due to Mrs. Thompson for fronds.



Fig. 439.—Portion of pinna.

GRATUM, *Lowe*. (Fig. 439.)—A distinct variety raised from spores at Highfield House. Length of frond eighteen inches, width five inches and a half. Pinnæ opposite, except three inches near the apex, where alternate; widest in the centre of the frond. A slender form, with very distant pinnæ, being from one to two inches apart on the basal half of the frond. Pinnules three inches long, linear-lanceolate. Pinnules leafy, but distant.



Fig. 440.—Pinna.

GRATISSIMUM, *Lowe*. (Fig. 440.)—A multifid form raised from spores of *multifidum* by Mr. Edwin Cooling, of the Mile-ash Nursery, Derby. Length of frond from fifteen to twenty inches. A slender graceful variety. Pinnæ approximate, two inches in length, narrow, their apices terminating in a crested apex. The superior basal pinnule twice the size of the others. The apices of all the pinnules bent over, as well as all the teeth. The apex of the frond terminating in a small corymbose head. I am indebted to Mr. E. Cooling for fronds.

VARIANS, *Moore*.—Raised from spores in the Fernery of Mr. J. H. Sclater, of Newick Park, near Uckfield. A remarkable and interesting variety of the *incisum* type, partaking, in the deeply-pinnatifid pinnules and enlarged anterior basal lobes, of the character of *laxum*. Fronds twenty-four to thirty inches long, and nine inches broad. Very variable. Some quite tripinnate, with pinnæ frequently two inches and a quarter wide at the base. Oblong-ovate, and suddenly tapering to a serrated acuminate apex. Pinnules distinct, some being one inch and a half long, ovate-oblong, and acuminate. In the attenuation of the points of the pinnules it is strikingly distinct. Pinnules profoundly pinnatifid, the basal ones pinnate. Sori everywhere copious.



Fig. 441.—Frond.

TRUNCATUM, *Clapham*. (Fig. 441.)—Found at Ilkley, in 1863, by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Two small plants were found growing in the crevice of a rock. Length four to six inches, width an inch and a

quarter at the apex of the frond, where widest, gradually becoming narrower to the base, where less than a quarter of an inch wide. Fronds truncate; pinnæ also truncate and opposite. Pinnæ and pinnules various in size and form, and occasionally wanting. An interesting Fern, the fronds of which have been forwarded by Mr. A. Clapham.



Fig. 442.—Frond.

APIOIDES, *Clapham*. (Fig. 442.)—A seedling raised from *grandiceps* by Mr. A. Clapham, of Scarborough. For the first two or three years this Fern had small dense fronds, but now it has become ramose. A very pretty rounded frond. Length

with the stipes six inches, breadth four inches. Rachis and rachides much dilated. My thanks are due to Mr. Clapham for fronds.



Fig. 443.—Portion of pinna.

ARCUOSUM, *Clapham*. (Fig. 443.)—Gathered near Ilkley, in July, 1863, by Mr. A. Clapham, of Scarborough. A form of *dissectum*, in which the fronds and pinnæ are arcuated. This bended character gives the frond a singular appearance. Length two feet, width eight inches.

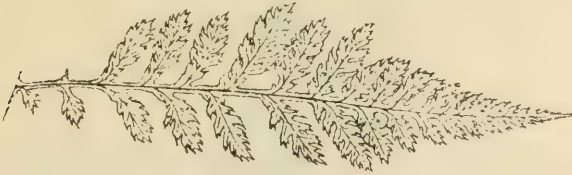


Fig. 444.—Pinna.

RACHIDIoidES, *Clapham*. (Fig. 444.)—Gathered near Scarborough, in October, 1864, by Mr. A. Clapham, of Scarborough. A distinct narrow-fronded form. Stipes and rachis covered with long scales. Length of frond twenty inches, of which the lower six inches is naked; width four inches at the widest part of the frond, that is, above the centre. Pinnæ alternate, small at the base, irregular in distribution, often a third of them absent, horizontal at the base, and ascending above, their apices acuminate and very sharp-pointed. I am indebted to Mr. Clapham, of Scarborough, for this variety.

PRÆMORSUM, *Moore*.—A curious dwarf barren form found in 1846 by Dr. Dickie on Ben-Mac-d'hui, at an altitude of three thousand seven hundred feet. Fronds eight inches long, with an irregular-lanceolate outline. Pinnæ and pinnules irregular in size and form. An uninteresting form, which may prove a variety of *Polypodium alpestre* when its fructification is ascertained.



Fig. 445.—Apex.

CRAIGII, *Moore*. (Fig. 445).—Raised from spores in 1864, by Mr. R. Craig, of Levens Hall, Milnthorpe. A pretty dwarf narrow variety, with a branching apex. Fronds eight inches long, and one inch broad, except at the apex, where it is two inches broad. Stipes and rachis red. Pinnæ various in shape, decurrent, very leafy, and crested at the apex. Pinnules very various in size and shape, the basal portion small but

conspicuously dentate, many of the others dilated or crested. The apex of the frond branched and crested. The two basal pairs of pinnæ descending, smaller, and not crested. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 446.—Middle pinnæ.

FOXTONI, *Stansfield*. (Fig. 446.)—Raised from spores in 1861, by Mr. Foxton, of Thirsk. A dwarf laciniate form, with fronds ten to twelve inches in length. Pinnæ distant, small, and broad, and very leafy at the base of the frond; widest in the centre, and less leafy. The pinnules mostly dilate at their apices. The apex of the frond acuminate. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 447.—Basal pinna.

BREVIPINNULUM, *Stansfield*. (Fig. 447.)—Found in the Vale of Todmorden, in 1864, by Mr. J. Law. A distinct form, with long narrow pinnæ. Length of frond fifteen inches, width five inches and a half near the base, becoming narrow to the apex, which is acuminate. Pinnæ ascending, approximate, the largest three inches in length, and scarcely more than a quarter of an inch wide, acuminate at the apex. Pinnules very various in size and shape, all rounded at the apex, and

minutely bidentate. The basal pair of pinnales usually much larger than the others. The upper half of the pinnæ not divided to the base. I am indebted to Messrs. Stansfield for fronds.



Fig. 448.—Middle portion.

PRITCHARDII, *Stansfield*. (Fig. 448.)—Found in 1861, near Ruthin, in North Wales, by Mr. T. Pritchard. In the *Fieldiæ* section, but having permanent differences of a marked character. The fronds of this form, unlike those of *Fieldiæ*, which are conspicuously truncate, form gracefully-curved lines. The fronds attain a length of forty inches, although scarcely more than an inch wide, and the habit of the plant is vigorous. The pinnæ are cross-shaped, sometimes ternate, and, as Messrs. Stansfield very aptly say, for at least three fourths of the length of the frond being knotted into small bows of from half an inch to three quarters of an inch in width. In the young state the fronds are not unlike *Frizelliæ*. The illustration is from Messrs. Stansfield.

VALIDUM, *Moore*.—Found at Dolgelly, in Wales, by the Rev. J. M. Chanter. Dwarf and strong-growing. Pinnæ crowded and acuminate; pinnules crowded. Lobes more or less incurved, and profoundly-pinnatifid. Rachis very broad and thick. Rachis and stipes reddish in colour. A form partaking of the characters of *laxum* and *rhæticum*.



Fig. 449.—Apex.

DOODIOIDES, *Lowe*. (Fig. 449.)—This variety was found in Sussex, and is exceedingly beautiful and distinct, and to all appearance quite constant. It is named *Doodioides* from the pinnæ resembling in some degree the form of a frond of a *Doodia*. The pinnules are short and irregular, making the pinnæ very narrow, whilst the segments are much toothed at their apices. Length of frond eighteen inches. It is in the possession of Mr. Stansfield, of Todmorden, from whom the frond for illustration has been received.

NUDATUM, *Moore*.—Found in Devonshire by the late Mr. C. Jackson. A dwarf curious variety. Stipes red. Frond abrupt. Pinnæ variable, the upper ones longest. Fronds narrow, from the abrupt shortening of most of the pinnæ. Remarkable for a bare space on the rachis half an inch long, devoid of pinnules. The apical portions occasionally forked or branched.

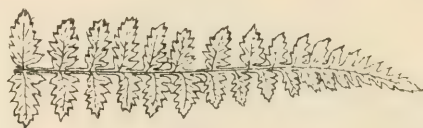


Fig. 450.—Middle pinna.

PPLICATUM, *Padley MS.* (Fig. 450.)—A most singular form found near Nettlecombe, by Mr. Charles Elworthy. Length of frond fourteen inches, width in the widest part of the frond nearly four inches. Pinnæ narrowing to the base and apex, descending at the base, horizontal in the centre of the frond, and ascending towards the apex; alternate and distant, broadest at the base, and gradually tapering to an acuminate apex. Pinnules plicate and crowded. Sori crowded. I am indebted to Mr. Elworthy for fronds.

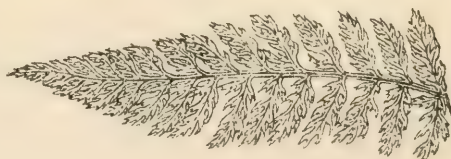


Fig. 451.—Middle pinna.

DELICATISSIMUM, *Stansfield.* (*Minutissimum*, Wollaston.) (Fig. 451.)—Raised from spores in 1863, by Messrs. Stansfield, of the Vale Nurseries, Todmorden. A delicate plumose variety, slender and exquisitely cut. Pinnæ crowded and overlapping,

broad at the base, and suddenly acute at the apex. Pinnules auriculate, and divided almost to the costa, the segments being a series of teeth with sori at their base. Length nine inches, width in the centre four inches. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 452.—Upper half.

PRITCHARDII-CRISTATUM, *Lowe*. (Fig. 452.)—Raised from spores by Messrs. Stansfield, Vale Nurseries, Todmorden, in 1865. A dwarf form of *Pritchardii*, differing in having the apex of the frond terminating in a branched and crested head. Length of frond eight inches. I am indebted to Messrs. Stansfield, of Todmorden, for the illustration.

CORYMBIFERO-DEPAUPERATUM, *Wollaston*.—Raised from spores by Messrs. Stansfield, Vale Nurseries, Todmorden, in 1863. A depauperate form of *corymbiferum*. A dwarf slender form. Length of frond about ten inches. Pinnæ remote, narrow, broadest at the base, and expanding into an elegant corymbiferous head. An illustration is unnecessary.



Fig. 453.—Middle portion.

CORNIGERUM, *Stansfield*. (Fig. 453).—Raised from spores in 1864, by Mr. R. Craig, of Levens Hall, Milnthorpe. A singular form, twelve inches in length, the frond narrow, and equal in width for the basal third, namely, two inches, then suddenly widest, that is, four inches and a half, gradually tapering to one inch and three quarters, and then suddenly becoming only half an inch for the three inches near the apex, the extreme end being acuminate. The pinnæ are various in form, the basal ones for four or five pairs descending; the pinnules leafy, much cut on their upper margin and at the end, the superior basal pinnule much larger, the upper portions usually undivided to the rachides. The central longer pinnæ often furcate, the pinnules irregular in size and form, laciniate, depauperate, or even wanting, frequently only a toothed lobe of diminutive size, in fact the frond is almost all teeth. The sori is situated on the inner margin of the teeth, so that it is marginal. Sori conspicuous and abundant from the base to the apex of the frond. The illustration is from Messrs. Stansfield, of Todmorden.

FISSIDO-ANGUSTIFRONS, *Ivery*.—Length of frond twenty-six inches; fronds narrowing to the base and apex, being eight

inches wide in the centre of the frond. Symmetrical in outline. Pinnæ crowded and ascending, the largest four inches and a half in length, and one inch and a quarter wide at the base, equal in width except near the apex, where drawn out to a fine point. Pinnules large, with rounded apices, crowded, broad, and coarsely dentate. Divided to the base, and auriculate. I am indebted to Mr. Ivery, of Dorking, for fronds. An illustration is unnecessary.



Fig. 454.—Apex.

CRISTULATUM, *Wollaston*. (Fig. 454.)—Raised from spores in 1863, by Messrs. Stansfield, Vale Nurseries, Todmorden. A beautiful rare dwarf form. Length of frond eight inches. Pinnæ narrow, three quarters of an inch long, equal in size from the base to the apex, where the frond branches out into a very much divided rounded crest of two inches and a half in diameter. The apices of the pinnæ largely multifid, and many of the pinnules dilate or minutely crested. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.

CAPITATUM, *Moore*.—Found in Devonshire, at Ilfracombe, by the late Mr. Jackson. Length eighteen inches, width six inches. Pinnæ broadest at the base, rather distant, tapering somewhat irregularly, and much narrowed at the apex. At the apex of the pinnæ are three or four full-sized pinnules, forming a terminal tuft. Pinnules more or less squared, profoundly-pinnatifid, the lobes having divergent teeth along their sides, and laciniate teeth at their apices. The upper half of the frond is more irregular and more lacinated. Stipites and rachides red.



Fig 455.—Middle portion.

FIELDIE-COMPOSITUM, *Ivery*. (Fig. 455.)—Length of frond twenty-six inches, width seven inches at the base, contracting to two inches from the centre of the frond. Pinnæ more or less horizontal on the lower half of the frond, distant, and four inches in length, and linear-lanceolate in form. In the upper half of the frond branching at the base in the way of *Fieldie*, but more horizontal, crowded, and irregular in length. Pinnules divided to the base, stipitate and auriculate and coarsely dentate, bidentate to quadridentate. Sori large and abundant. I am indebted to Mr. Ivery, of Dorking, for fronds.

OBTUSUM, *Moore*.—Found at Virginia Water, Surrey, by Dr. Allchin, and at Todmorden by Mr. Stansfield. Fronds broadly-lanceolate, the leafy part being half as broad as long. Length of frond twenty-four inches. Pinnæ broad and tapering. Pinnules oblique, and obtusely ovate-oblong in a marked degree. Lobes variously toothed, the teeth not numerous, broad and blunt. Sori in two lines, nearer the midrib than the margin.

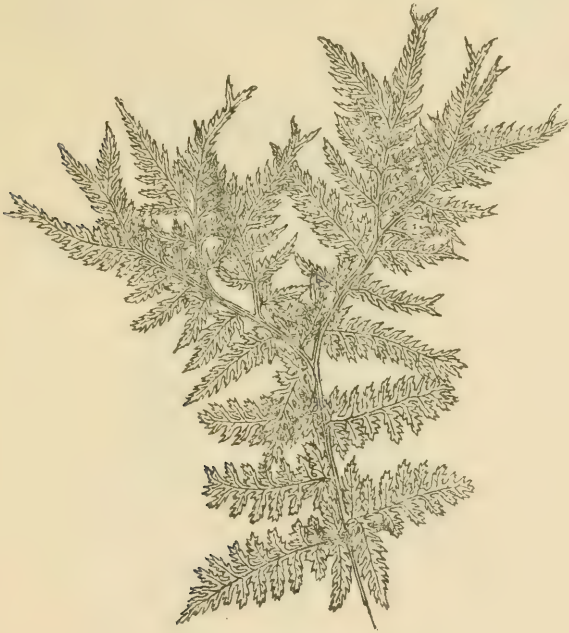


Fig. 456 —Apex.

FIELDIÆ-COMPOSITUM-MULTIFIDUM, *Ivery*. (Fig. 456.)—A form similar to *Fieldiæ-compositum*, differing in the basal half of the frond having the pinnæ furcate, in the centre to the apex of the frond having the pinnæ variously dilate or incised, and in the apex being branched, and the tips of each branch furcate. Length thirty inches, of which the basal nine inches is the stipes. Width in the basal half of the frond five inches, and in the upper half two inches, the tasselled apex being three inches across. My thanks are due to Mr. Ivery for fronds.

POLYCLADON-EROSUM, *Stansfield*.—Found near Corwen, in North Wales, in August, 1864, by Mr. A. Stansfield, Jun. A slender erose form, with fronds eighteen inches long, and six inches broad in the centre. The pinnæ mostly normal, the pinnules various in size, frequently wanting. My thanks are due to Messrs. Stansfield for fronds. An illustration is unnecessary.



Fig. 457.—Middle portion.

FIELDIÆ-LANCIFOLIUM, *Ivery*. (Fig. 457).—An interesting form of *Fieldiæ*, with fronds two feet in length, and only one inch and a half wide. The apex of the frond acuminate. The basal pinnæ two inches and a half in length. Pinnæ branching near the rachis, and both ascending and descending, and being crowded, crossing each other. The pinnæ are long in the lower half of the frond; and only half an inch, and much more branched in the upper half. My thanks are due to Mr. Ivery, of Dorking, for fronds.

CAUDICULATUM, *Moore*.—Found at Chambercombe, in Devonshire, by the Rev. J. M. Chanter. A singular form, eighteen inches long; fronds narrow and erect. Somewhat bare of pinnæ below, and irregularly placed; above crowded; occasionally wanting, or very various in length. Usually branched near the base, or multifid and spread out at the apex. Mostly caudate at the points, the many tail-like projections of the numerous divisions of the crowded multifid apices of the pinnæ is the remarkable feature. The frond also terminates in a compact multifid head.



Fig. 458.—Upper half.

CONVEXUM-MULTIFIDUM, *Lowe*. (Fig. 458.)—A slender convex and corymbose form, raised from spores in the Vale Nurseries, Todmorden, in 1864. Length of frond six inches, width scarcely two inches, nearly equal throughout. Pinnæ opposite and sub-opposite above, convex, with here and there a crested or dilated apex. The apex of the frond multifid.



Fig. 459.—Pinna.

GRACILE, *Moore*. (Fig. 459.)—Brought into notice by Dr. Lyall, of Newburgh, Fifeshire. A handsome variety, in the possession of Messrs. Parker and Williams, of Holloway. Slender, lax, dwarf, and drooping. The fronds (excluding the stipites) twelve inches long, and six inches broad. Lanceolate. Pinnæ distant and caudately acuminate. Pinnules linear-oblong; teeth linear-acute. Secondary rachides very slender.



Fig 460.—Apex.

DILACERATUM, *Moore*. (Fig. 460.)—Found in 1864 in the Vale of Todmorden by Mr. A. Stansfield. A singular dwarf form. Length of frond four to six inches. Pinnæ and pinnules very various in size and form, and much lacerated throughout the frond. I am indebted to Messrs. Stansfield, of Vale Nursery, Todmorden, for fronds.



Fig. 461.—Apex.

Fig. 462.—Middle pinna.

DIADEMATUM, *Lowe*. (Figs. 461 and 462.)—An exceedingly handsome form raised from spores by Mr. Elworthy, of Nettlecombe. In the narrow outline of the frond not unlike *formoso-cristatum*. Pinnæ remote, ascending, short, and terminating in a much-crested head of above an inch wide. Pinnules ovate-oblong, dentate, and rounded at their apices, but not dilated as in *formoso-cristatum*. Some of the pinnules attached their whole width to the rachides, erose, depauperate, or wanting. The frond terminating in a much-branched dense

tassel, four inches and a half in width. Length of frond fourteen inches. My thanks are due to Mr. Elworthy for fronds.



Fig. 463.—Middle pinnae.

PLUMOSO-MULTIFIDUM, *Stansfield*. (Fig. 463.)—Found some five or six years ago on Ben Lawers, Scotland, by Mr. W. Marshall. A feathery form of *multifidum*. Fronds of moderate size. Pinnæ crowded. Pinnules plumose; the tips of the pinnæ and the apex of the frond multifid. I am indebted to Messrs. Stansfield for the illustration.



Fig. 464.—Middle pinnae.

STIPATUM, *Wollaston*. (Fig. 464.)—Found at Dolgelley in 1864, by Mr. Bruce Findlay. This appears to be the *Grantia* of Messrs. Sim. A dwarf form with a very broad stipes and rachides. Pinnæ crowded, pinnules crowded. Pinnæ linear-lanceolate. The illustration is from Messrs. Stansfield, of Todmorden.

LATIPES, *Moore*.—Found near Doncaster by Mr. S. Appleby. Fronds pyramidal, and about twenty-six inches in length, and nine inches in width across the base, where broadest. Stipes nearly twelve inches long. Pinnæ more than two inches in width. Pinnules large and coarse, two inches in length, the

lowest sessile and the others adnate, pointing forwards, ovate-lanceolate in shape, profoundly pinnatifid. Teeth irregular and coarse. Sori remarkably large. A most singular variety.

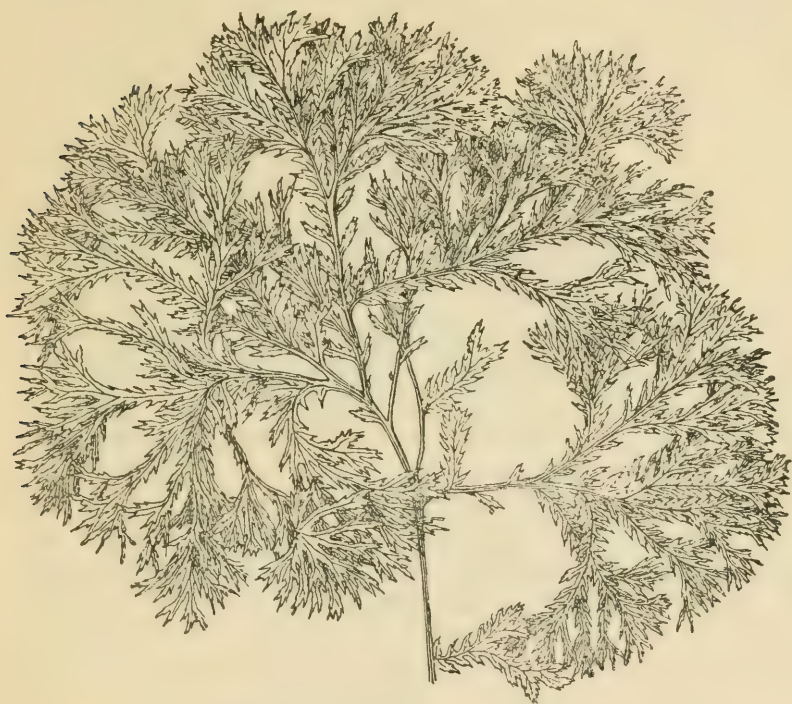


Fig. 465.—Apex.

ORBICULATUM, *Lowe*, (*Capitatum*, Padley, MS.) (Fig. 465).—This very fine variety was raised by Mr. Elworthy, of Nettlecombe, from spores. It has been named *capitatum* by the Rev. Charles Padley, who seems to have been unaware of the fact that a variety *capitatum* already exists. A depauperate form, eleven inches in length, having a much-branched rounded head of four inches in width, and almost as much in depth. The pinnæ are mostly sub-opposite, many wanting, some an inch in length, others not a quarter of an inch, the pinnules at their base diminutive, widening considerably towards the apex, and becoming branched or capitate. The apex of the frond terminating in a compact large crest, branching and

sub-branching in an extraordinary degree, their apices terminating in a number of linear segments, giving a delicate appearance to this conspicuous tassel. My thanks are due to Mr. Elworthy, of Nettlecombe, for fronds.



Fig. 466.—Middle pinna.

RHÆTICUM, *Linnaeus*. (Fig. 466.)—A narrow, erect, rigid, lanceolate-fronded form, eighteen inches to four feet in length, and five inches wide, with ascending, approximate, acuminate pinnæ; petiolate, with coarsely dentate, somewhat linear pinnules. Copiously soriferous. A not uncommon form throughout Great Britain and Ireland. The pinnules are narrow, owing to the points of the lobes being inflected over the sori. The anterior basal pinnules and anterior basal lobes are all considerably longer than the rest. Pinnæ distant.



Fig. 467.—Middle portion.

APICULATUM, *Lyall*. (Fig. 467.)—Introduced into general notice by Dr. Lyall, Newburgh, Fifeshire. A lovely, small, fragile, bended-fronded Fern. Length of frond nine inches, width three inches. Pinnæ narrow and caudate. Pinnules small and ovate oblong. The apex of the frond very slender, and two or three times finely forked. The illustration is from Messrs. Stansfield.

FURCANS, Moore.—Found near Harrogate by Mr. A. Clapham. Length twenty inches. Lanceolate. Pinnæ distant below, and approximate above, their apices divided into two or three flat tapering diverging points. Pinnules usually pyramidal and profoundly pinnatifid. Lobes with blunt teeth, sometimes abbreviated and præmorse, and briefly bifid. Fronds somewhat irregular.



Fig. 468.—Middle pinna.

ACUMINATISSIMUM, Moore. (Fig. 468.)—A fragile, interesting plumose form; fronds twelve inches in length and five inches and a half wide; pinnæ larger on the one side of the frond. Pinnules large, much divided, and their lobes long and narrow.



Fig. 469.—Middle portion.

FILUM, Lowe. (Fig. 469.)—A delicate-looking variety, with fronds nine inches in length, and three in width in the centre of the frond, where widest. The rachides thin, round, and wire-like, hence the name. Pinnæ approximate, linear-lanceolate, acuminate, occasionally furcate. Pinnules divided to

the base, but not stalked, somewhat distant, linear-oblong, with a rounded apex, and dentate along their margins. Fronds and pinnæ flexuose, the pinnæ descending on the lower half of the frond. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 470.---Upper half.

CORONANS, *Sim.* (Fig. 470.)—A dwarf, slender, pretty, multifid variety. Length of frond seven inches, width two inches in the centre of the frond, contracting in width from towards the base and apex. The apex of the frond branching into a crested tassel. Pinnæ opposite below and alternate above, brief, and multifid in a digitate manner at their apices. Pinnules oblong, with a rounded apex, the basal pair of pinnules the largest. Minutely dentate. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 471.—Middle portion.

REMOTUM, *Wollaston*. (Fig. 471.)—Found in North Devon in 1864 by Mr. J. Dadds. Another dwarf form. Pinnæ very brief at the base, widest in the centre of the frond, and narrowing to the apex. Pinnæ and pinnules remote, and mostly sub-opposite. Pinnules broad, with rounded apices, undivided and minutely dentate. Length of frond eight inches.



Fig. 472.—Middle portion.

EROSO-CRISTATUM, *Moore*. (Fig. 472.)—Raised from spores some years ago by Messrs. Stansfield, Vale Nurseries, Todmorden. A narrow-fronded Fern, with fronds eighteen inches in length, and four inches in width in the widest part. Pinnæ distant, especially so near the base of the frond. Pinnules broad, leafy, and rounded at the apex, and dentate or bidentate on their margins; erose, or even wanting, some pinnæ scarcely more than the rachides. Pinnæ slightly crested, and the apex of the frond terminating in a small but conspicuous crest. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 473.—Frond.

SCOPEFORME, *Lowe*. (Fig. 473.)—Raised from spores by Mr. Elworthy, of Nettlecombe. Although of the *grandiceps* section still it is distinct from that variety, and in the ascending almost perpendicular branches of the apex closely resembling a besom, hence its name. The stipes and rachis are all but naked, having only four or five small pinnules irregularly dispersed. Length of frond seven inches, of which the branching crown occupies the three inches at the apex. The width of the apex two inches, the pinnules being narrow and much divided, forming a very close compact head, with a cuneate base. I am indebted to Mr. Elworthy for fronds.



Fig. 474.—Middle portion.

FISSIDENTE-EXCURRENS, *Wollaston*. (Fig. 474.)—Brought before the public by Mr. Ivery, of Dorking. A slender form with fronds eight inches in length, and two inches in width. Pinnæ distant, and widest in the centre of the frond. Pinnules various in form and size, some more or less normal, others much cleft and lacinated, some only the midrib present as a thorn-like appendage. The illustration is from Messrs. Stansfield, of Todmorden.

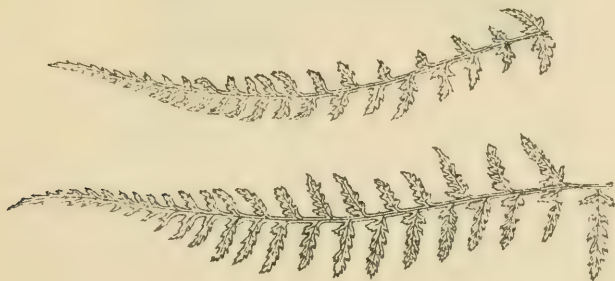


Fig. 475.—Upper pinna.

Fig. 476.—Middle pinna.

CAUDATUM, *Lowe*. (Figs. 475 and 476.)—A distinct slender form, found in Devonshire by the Rev. Charles Padley, of Beaconfield, near Plymouth. Length of frond eighteen inches, width seven inches in the centre of the frond, where widest. Pinnæ distant, the longest nearly four inches long, and scarcely half an inch broad, narrow and much attenuated, caudate at

the apex, terminating in a very long fine point. Pinnules divided to the rachides, the basal ones subpetiolate, distant, long, narrow, auriculate, and minutely dentate. Stipes, rachis, and rachides thin and wire-like. I am indebted to Mrs. Thompson, of South Lawn, Exeter, for fronds.



Fig. 477.—Apex.

Fig. 478.—Middle pinna.

FORMOSO-CRISTATUM, *Padley, MS.* (Figs. 477 and 478.)—A very elegant narrow-fronded variety, raised from spores by Mr. Elworthy, of Nettlecombe. Length of frond fourteen or fifteen inches, width three inches and a half. Pinnæ ascending, distant, short, and terminating in a dense round tassel of three quarters of an inch across, and as much in depth. Pinnules distant, usually oblong, subpetiolate, with dilated subcristate apices, occasionally a pinnule will be much larger and branched, and more often erose or even wanting. The frond terminating in a very heavy much-branching crest of three inches across. My thanks are due to Mr. Elworthy for fronds.

CONCINNUM, *Moore*.—Found near Scarborough by Mr.

Clapham. A handsome form. Fronds broadly-lanceolate, and undivided at the apex. Pinnæ linear-oblong, ending in a small multifid tuft. Pinnules ovate-acute, distinct and profoundly-pinnatifid below. Lobes narrow-oblong. Teeth fine, even, and acute. Remarkable for the very regular toothing, and for its less decidedly multifid character than some other varieties.



Fig. 479.—Middle portion.

LATIFOLIUM-MULTIFIDUM, *Stansfield*. (Fig. 479.)—Found at Aberfeldy, in Perthshire, in 1863, by Mr. A. Stansfield, Jun., of Vale Nursery, Todmorden, and Mr. J. Fielden. A slender plumose form of *latifolium*, with crowded pinnæ beautifully crested. Length of frond twelve inches, width four inches at the centre of the frond, where widest, and narrowing to the base and apex gradually and symmetrically. The three or four basal pairs of pinnæ somewhat distant and descending, the others crowded and ascending, touching each other, their apices furcate and crested; pinnules crowded, also touching each other, and feathery. The illustration is from Messrs. Stansfield.

PLUMOSUM, *Moore*.—Fronds thirty inches long, and twelve inches broad. Very broadly-lanceolate, and distinctly tripinnate. Pinnæ in the centre of the frond from five to six inches long, and two inches and a half broad. The longer pinnules an inch and a quarter long, nearly parallel-sided, and the apex shortish-acuminate. Somewhat distant below, and crowded above. Pinnules ovate-acuminate, overlapping, divided into distinct secondary pinnules which are half an inch long, linear, and inciso-pinnatifid; segments narrow, having linear-acute teeth.

The ultimate divisions, being so narrow and crowded, gives the frond a feather-like appearance, exceedingly light and elegant. Sori very imperfect, and almost destitute of indusia. Found in 1857 near Skipworth, in Yorkshire, by Mr. J. Horsfall, and now in the possession of Messrs. Stansfield, of Todmorden. Mr. Swynfen Jervis, of Darlaston Hall, Staffordshire, has also found a form of this variety at Axminster, which is perhaps more handsome than that found by Mr. Horsfall. The Rev. C. Padley has also found another form in Devonshire.



Fig. 480.—Pinna.

SUB-PLUMOSUM, *Padley, MS.* (Fig. 480.)—Found near Nettlecombe by Mr. Charles Elworthy. Length of frond twenty-six inches, width eight inches and a half. Pinnæ ascending, except the basal pair, sub-opposite, except near the apex of the frond, approximate, touching each other, linear-lanceolate, and terminating in a long fine point. Length eight inches, width two inches. Pinnules at the base of the pinnæ three-quarters of an inch in length, curving upwards, widest at the base, and acuminate at their apices. The lobes opposite, divided to the base, linear-oblong, with their apices bi- or tridentate. My thanks are due to Mr. Elworthy for fronds.



Fig. 481 --Middle portion.

ARCTUM, *Lowe*. (Fig. 481.)—A distinct, narrow, slender form, raised from spores by Messrs. Stansfield, in the Vale Nurseries, Todmorden. Length of frond ten inches, width one inch and a half. Fronds nearly equal in width. Pinnæ brief, alternate, thin, mostly abrupt or dilate at their apices. Pinnules cut to the rachides, various in form and size. Very leafy and variously dentate, some minute, others conspicuous and lacinate. My thanks are due to Messrs. Stansfield for fronds.



Fig. 482.—Upper pinna.



Fig. 483.—Middle pinna.

FOLIACEUM, *Lowe*. (Figs. 482 and 483.)—A lax form found in Devonshire, by the Rev. Charles Padley, of Beaconfield, near
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Plymouth. Fronds slender and bending, fifteen inches in length, and four inches in width, slightly less at the base. Stipes and rachis thin and slender. Pinnæ opposite, except near the apex, where alternate, linear-lanceolate, and distant. Pinnules very large, leafy, and divided to the rachides; decurrent, simple, with broad shallow teeth; in the upper half of the frond long narrow lacinate teeth. My thanks are due to Mrs. Thompson, of South Lawn, Exeter, for fronds.



Fig. 484.—Apex.

Fig. 485.—Middle pinna.

CORYMBIFERO-STRICTUM, *Lowe*. (Figs. 484 and 485.)—Raised from spores in 1864, by Messrs. Stansfield, Vale Nurseries, Todmorden. A narrow-fronded dwarf form of *corymbiferum*. Length of frond ten inches, width two inches and a half. Pinnæ broad, brief, and dilated at their apices into a compact, rounded, and very leafy head. Pinnules rounded and conspic-

uously dentate. The apex of the frond terminating in a large, compact, multifid head. The illustration is from Messrs. Stansfield.



Fig. 486.—Apex.



Fig. 487.—Basal pinna.

MULTIFIDUM-NANUM-ANGUSTATUM, *Stansfield*. (Figs. 486 and 487).—Length of frond six inches, fragile, with various formed and sized pinnæ much laciniated, and very grotesque; the apex of the frond much branched and cristate. This variety was raised from spores by Messrs. Stansfield, of the Vale Nurseries, Todmorden.

ODONTOMANES, *Moore*.—Found in the Vale of Todmorden by Mr. Stansfield. Another form of the *molle* group, with broadly-lanceolate fronds; brief, broad, and acuminate pinnæ; and somewhat distant, patent, decurrent, and profoundly-pinnatifid pinnules. The lobes remarkable for their long conspicuous irregular teeth. The best forms are those found by Miss S. Beever at Conistone, and by Mr. Foxton at Thirsk, in Yorkshire. Less marked forms have been gathered at Tunbridge

Wells by Mrs. Delves; at Virginia Water by Dr. Allchin; at Dorking by Mr. W. Pamplin; at Challacombe and Marwood by the Rev. F. Mules; at Barnstaple by Mr. H. F. Dempster; at Trentham Park by Mr. G. B. Wollaston; at Titterstone, Clee Hill, Shropshire, and at Prescott, Lancashire, by Mr. R. Morris; at Todmorden by Mr. A. Stansfield; at Ruthin, in Denbighshire, by Mr. T. Pritchard; at Llandaff by Miss Lewis; at Tarbet, Rothesay, and Glen-Crœ, by Mr. T. Moore; at Chaigeley Manor, and near Ambleside, by myself; at Ardrishag by Miss F. Griffith; at Cove by Mr. A. Tait; at Lisdoonvarna by Mr. R. Barrington; and at Dumphail, Inverness-shire by Miss F. Brown.



Fig. 488.—Upper half.

STANSFIELDII, *Lowe*. (Fig. 488.)—A remarkable dwarf form in the *Frizelliae* section. Length of frond five inches, width from one half to three quarters of an inch. Slender, linear. Pinnæ brief, consisting merely of a rounded much-cut segment, which is petiolate, not unlike an oak tree in form. The apex of the frond terminating abruptly. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.





Fig. 489.—Apex.

LACINIATO-LAXUM, *Lowe*. (Fig. 489.)—A singular form raised from spores in 1865, in the Vale Nurseries, Todmorden, by Messrs. Stansfield. Fronds six inches long and two broad. A lax slender form. Pinnæ sub-opposite, distant, and membranaceous. Various in form, and terminating laciniately. Pinnules very various in size and form, and lacinate. The illustration is from Messrs. Stansfield, of Todmorden.

LACINIATUM, *Moore*. (Plate XXXIX—A.)—An interesting dwarf variety, originally found at Nettlecombe, by Mr. C. Elworthy. Subsequently a number of varieties differing somewhat from *laciniatum* have been referred to this species by Mr. Thomas Moore; these were found near Thirsk, Yorkshire, by Mr. A. Clapham; Todmorden, by Mr. A. Stansfield; Prescott, by Mr. R. Morris; Balcombe, Sussex, by Mr. G. Hankey; Edinburgh, by Mr. A. Tait; Scarborough, by Mr. A. Clapham; and in the north of Ireland, by Mr. A. Stansfield. A difficult form to describe on account of the variable character of its

fronds. Generally lanceolate. The pinnæ very irregulare, some brief, others acuminate, others præmorse. Pinnules decurrent, various in size and form, irregularly and profoundly laciniated. Sori abundant and crowded about the base of the laciniated lobes. Sometimes the fronds are considerably depauperated, the pinnæ being only of the size of ordinary pinnules, flabellate, lobate, truncate, and palmate intermingled. Sometimes the pinnules are nearly all depauperated. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 490.—Frond.

FRIZELLÆ-CRISTATUM, *Lowe*. (Fig. 490.)—An interesting dwarf Fern raised from spores in 1864 by Mr. Thomas Glover, of Smedley Hill, Manchester. Length of frond five inches and a half, width only three eighths of an inch, being equal in width throughout the frond, except at the apex, where it becomes branched and crested, the cristate apex being an inch and a half in width. The pinnæ resemble those of

Frizellia, hence its name. The fronds furnished to me were of the second growth, and small, it therefore probably attains twice the size as here quoted. My thanks are due to Mr. Thomas Glover for fronds.



Fig. 491.—Upper portion.
(*Incisum-truncatum*.)



Fig. 492.—Middle portion.
(*Fieldiæ-imbricatum*.)

INCISUM-TRUNCATUM, *Ivery*. (Fig. 491).—Length of frond eleven inches, narrow, only one inch wide, except near the apex, where irregular, and sometimes two inches wide. Pinnæ irregular in size and form, incised and truncate, often much abbreviated, but deeply and narrowly incised. A slender interesting Fern. My thanks are due to Mr. Ivery, of Dorking, for fronds.

FIELDIÆ-IMBRICATUM, *Ivery*. (Fig. 492).—This exceedingly interesting form differs from the variety *Fieldiæ* in having imbricated fronds. Raised from spores by Mr. Ivery, of Dorking, to whom I am indebted for fronds.



Fig. 493.—Apex.

PULCHERRIMUM, *Ivery*. (Fig. 493.)—A pretty plumose form, twelve inches in length, with symmetrical fronds, having crowded pinnæ and pinnules; the pinnæ broad at the base, and caudate and acuminate at the apex. Pinnules linear to linear-oblong, auriculate, finely but closely serrate, the lower lobes bidentate. The superior basal pinnule the largest. The illustration is from Mr. Ivery, of Dorking.

There are yet a number of forms that I am not sufficiently acquainted with, some of which are likely to prove very distinct, of these we shall say more at the conclusion of the work. Amongst those not yet described are the following, most of which I have not even seen:—

Acutidens, *Moore*.
Adnatum, *Moore*.
Amplum, *Moore*.
Biforme, *Stansfield*.

Brachycladon, *Moore*.
Compositum, *Sim*.
Curvatum, *Moore*.
Deficiens, *Moore*.

- Diffisso-coronans, *Sim.*
 Diffisso-multiforme, *Moore.*
 Diffisso-polydactylum, *Sim.*
 Diffissum-angustifrons, *Moore.*
 Diffissum-regulare, *Moore.*
 Discretum, *Moore.*
 Distans, *Moore.*
 Divaricatum, *Moore.*
 Excellens, *Moore.*
 Flexum, *Moore.*
 Foliosum, *Moore.*
 Foveatum, *Moore.*
 Frondoso-polydactylum, *Sim.*
 Gracile-polydactylum, *Moore.*
 Gracilissimum, *Moore.*
 Grande, *Moore.*
 Incomptum, *Moore.*
 Inconditum, *Moore.*
 Informe, *Moore.*
 Infundibuliceps, *Moore.*
 Involvens, *Moore.*
 Laxum-attenuatum, *Moore.*
 Laxum-multifidum, *Moore.*
 Laxum-penicillatum, *Moore.*
 Lepidum, *Sim.*
 Molle, *Moore.*
 Multidens, *Moore.*
 Multifidum-furcans, *Moore.*
 Oblongum, *Moore.*
 Ordeanæ, *Moore.*
 Pannoso-diffissum, *Moore.*
 Patens, *Moore.*
 Pinnatum, *Moore.*
 Polydactylon-majus, *Moore.*
 Productum, *Moore.*
 Ramoso-polydactylum, *Moore.*
 Refractum, *Moore.*
 Repressum, *Sim.*
 Rhæticum-interruptum, *Moore.*
 Rhæticum-irregulare, *Moore.*
 Rhæticum-multifidum, *Moore.*
 Rhæticum-nanum, *Moore.*
 Sagittatum, *Moore.*
 Sinclairiæ, *Moore.*
 Stenophyllum, *Moore.*
 Suberuciatum, *Sim.*
 Sublaciniatum, *Moore.*
 Thyssanotum-minus, *Sim.*
 Thyssanotum-multiceps, *Sim.*
 Tyrelliæ, *Moore.*

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GENUS VII.

ASPLENIUM. LINNÆUS.

AN interesting group of Ferns which is somewhat well represented in Great Britain.

Fronds herbaceous or membranaceous, and coriaceous. Simple lobed, pinnate, bipinnate, or decomposed. The rachis or veins in some proliferous.

Caudex brief, erect or decumbent.

Sori indusiate, linear, short or elongate. The receptacles lateral, on the anterior side of the veins. Indusium linear and membranaceous. Veins simple, or forked from a central costa.

Asplenium differs from *Athyrium* in having the sori straight, and from *Scolopendrium* in having single fructification, that is, not in pairs standing face to face. The spore-cases grow along the side of the vein, and the indusium is also attached laterally.

The British *Aspleniums* are divided into two groups, namely, *Euasplenium* and *Acropteris*.

In *Euasplenium* are *lanceolatum*, *fontanum*, *adiantum-nigrum*, *marinum*, *trichomanes*, and *viride*.

In *Acropteris* are *ruta-muraria*, *Germanicum*, and *septentrionale*.

In *Euasplenium* we have the sori oblong or linear, with the veins simple or forked, and diverging from a central costa; and in *Acropteris* we have linear elongate sori, with flabellately-forked veins without a costa.





Fig. 494.—Apex.

ASPLENIUM LANCEOLATUM.

HUDSON.

The Lanceolate Spleenwort.

PLATE XL.

<i>Asplenium lanceolatum</i> ,	HUDSON. SMITH. DEAKIN.
“ “	HOOKE AND ARNOTT. BABINGTON.
“ “	BENTHAM. NEWMAN. MOORE.
“ “	SOWERBY. SWARTZ. WILLDENOW.
“ “	POIRET. SPRENGEL. PRESL.
“ “	LINK. RUPRECHT. FEE.
“ “	METTENIUS. NYMAN. E. J. LOWE.
“ <i>Billotii</i> ,	SCHULTZ.
“ <i>cuneatum</i> ,	SCHULTZ.

<i>Asplenium Perreymondii</i> ,	BALBIS.
“ <i>rotundatum</i> ,	KAULFUSS. PRESL.
<i>Polypodium adiantifolium</i> ,	POIRET.
<i>Tarackia lanceolata</i> ,	PRESL.

Asplenium—Spleenwort.

Lanceolatum—Lanceolate.

THIS species is found more or less in the neighbourhood of the sea.

A native of Cornwall, abundant about the Land's End and Penzance, and found at St. Ives and Enys Penryn. In Devonshire on Morwell Rocks, on the banks of the Tamar and Plym, Bickley Vale, Marwood, Shaugh, Lynmouth, Buckland Monachorum, Tavistock, Salcombe, and Torquay. In Somersetshire at Selworthy, etc. In Sussex and Kent, at Tunbridge Wells. In Gloucestershire, at Frenchay, Beechly, and near Stapleton. In Wales, in Pembrokeshire, Glamorganshire, Merionethshire, Carnarvonshire, and Denbighshire.

In Ireland, only found at Kinsale, Cork, where it was discovered by Mr. J. Woods.

Also found in Guernsey, Jersey, Scilly, and Ramsay Islands.

Abroad it is a native of Madeira, Azores, Algiers, Tangier, Spain, Portugal, Germany, Belgium, Switzerland, and France.

A handsome Fern, easily grown in a well-drained compost of peat loam and sand. It requires a sheltered situation, and a mild climate, and detests excessive moisture.

The fronds vary from four inches to eighteen inches in length, are rigid, and of a brilliant green colour.

Lanceolate and pinnate.

Pinnæ ovate-lanceolate, broadest at the base, and narrowing to the apex, scarcely stalked, the lower more distant.

Pinnules obovate, obliquely-ovate, somewhat cuneate at the base. In the large fronds the pinnules are pinnatifid below, with mucronately-toothed lobes.

Stipes brief, about one third of the length of the frond, dark chesnut-coloured below, the dark colour extending along the back of the rachis.

Stipes and rachis sparingly scaly.

Caudex brief, thick, tufted, and densely scaly.

Sori scattered over the whole under side of the frond. Indusiate, oblong, and produced along the anterior sides of the venules, submarginal, and eventually confluent.

Indusium white. Veins of the pinnules consisting of a flexuose midvein, alternately branched.

This species is more nearly allied to *Asplenium adiantum-nigrum* than any other British Fern, yet differs in the form of the frond, by its hair-scales on its rachides, in its oblong sori, and by the spores being produced above the fork of the veins, whilst in *adiantum-nigrum* it is below the forking.

It has also a thinner frond, and the pinnules more equal in size.

I am indebted to Mr. Clift, of Balsall Moor, Birmingham, for a very fine plant, a collector to whom I shall have again to refer, and who has found some excellent forms of British Ferns.

There are very few varieties of this species.



Fig. 495.—Apex.

KALON, *Lowe*. (Fig. 495.)—Found in Devonshire in 1864. The frond nearly equal in width, only slightly diminishing in the basal pair of pinnæ and near the apex; the frond terminating in a square wide apex. The basal pinnæ descending, the others horizontal, and the apical pair ascending. Pinnæ crowded, and on their basal half overlapping, elongate-triangular,

their apex blunt, triangular-rotund. Pinnules petiolate, except at the apex of the pinnae, distant, large; their base cuneate, entire; their margins minutely fringed with diminutive teeth; occasionally the pinnules are wanting. Length from four to five inches; colour a rich green. My thanks are due to Messrs. Stansfield for fronds.



Fig 496.—Apex.

OBTUSUM, Clapham. (Fig. 496.)—A distinct form raised from spores by Mr. A. Clapham, of Scarborough. The fronds, which are from eight to ten inches in length, terminate obtusely. The pinnae are broader at the base. The basal pinnules are much larger, more divided, and more distant. My thanks are due to Mr. Clapham for fronds.

MICRODON, Moore. (*Asplenium microdon*, Moore, and *A. marinum* var. *microdon*, Moore.) (Plate XXXIX.—B.)—This handsome and very distinct form was found in Guernsey, in 1855, by Miss Wilkinson, and subsequently by Miss Mansell, of the Quesne, and Mr. C. Jackson. Also near Penzance by Mr. G. Wager. The fronds are irregularly linear, with a tapering point, pinnate, and from six to twelve inches in length. Pinnæ distinct; approximate in the lower half of the frond, briefly stalked, pyramidal, the lowest triangular, oblique, deflexed, and tapering to a blunt point; the upper pinnæ shorter, crowded, adnate with the slightly-margined rachis; lobed and undulated at the margin; the basal lobes rounded, and divided nearly to the costa, and overlapping, the divisions

shallower upwards. Distinctly toothed, the teeth being small and transparent. This form is remarkable for its denticulated margin and small sori. I am indebted to Mr. Ivery, of Dorking, for plants, and to the Rev. C. Padley, of Beaconfield, near Plymouth; Mr. Cooling, of Derby; and Mr. Edwards, of Nuttall, for fronds.



Fig. 497.—Frond.

CAUDATUM, *Lowe*. (Fig. 497.)—A dwarf singular variety, much less divided, bipinnate; pinnæ distant, the lower ones divided to the costa, the upper ones simply auriculate. The frond terminating in a caudate apex. Densely soriferous to the top of the frond. Raised from spores. Length of frond four to five inches.

CLAPHAMII, *Moore*.—An accidental seedling in the fernery of Mr. Clapham, of Scarborough. Nearly allied to *microdon*, but having yet narrower almost parallel-sided fronds, with an irregular or sinuated margin, and a brief narrowed apex. Length of frond five inches, and three fourths of an inch wide; linear-acute in form. Pinnæ nearly equal in size, sessile, with a narrow attachment at the base, becoming more

adnate upwards, and confluent in the upper half. Much imbricated. The lower pinnae bluntly triangular, above obliquely and transversely oblong, in the upper half crenately lobed.



Fig. 498.—Apex.

BIFIDUM, *Lowe*. (Fig. 498.)—A dwarf form found in Devonshire, differing in having the fronds bifid near the apex. Length of frond four inches.



Fig. 499.—Middle pinna.

KITSONIÆ, *Lowe*. (Fig. 499.)—A large-growing lax form, found in Devonshire by Miss Kitson. Length of frond fourteen inches, of which the basal two inches and a half is the rachis; the distance between the basal and next pair of pinnae two inches and a half, then half an inch apart and alternate, the two basal pairs being sub-opposite. The frond widest in the centre, and nearly equal in size, very gradually tapering towards the apex. Pinnae everywhere lax, decurrent above, their apices blunt. Pinnules lax and dentate, the superior

basal ones larger and more divided, the others cuneate at their base, and flattened and dentate at their upper margin; ascending. The two basal pinnæ ascending, the pinnules of which are only half the size of those of the other pinnæ. My thanks are due to Miss Kitson for fronds.



Fig. 500.—Middle pinnæ.

INCISUM. (Fig. 500.)—Found in Jersey. A robust form, twelve inches in length. Pinnæ alternate, distant below, approximate above. Pinnules deeply incised, with conspicuous sharp-pointed teeth, occasionally depauperated or even wanting. My thanks are due to Messrs. Stansfield for fronds.



Fig. 501.—Frond.

EXCISUM, *Lowe*. (Fig. 501.)—A dwarf form, found at Shaw-bridge, in South Devon, by Mr. G. W. Edwards, of Nuttall. The apex of the frond is as if bitten off, and the pinnules on the upper half of the frond are variable in form and much contracted. I am indebted to Mr. Edwards for a frond.

LACINIATUM, *Wollaston*.—A sub-permanent form found in the Channel Islands. Depauperated. The leafy portion more or less wanting, the pinnæ and pinnules frequently mere ribs, and the copious fructification protruding on the upper surface of the frond.

CRISPATUM, *Moore*.—Found in Guernsey by Mr. C. Jackson. Distinctly bipinnate. The margins of the lobes of the pinnules are curled under so as to have a crispy character, the thickened teeth by this means becoming conspicuous.



ASPENIUM SEPTENTRIONALE.

A. GERMANICUM.



Fig. 502.—Portion of mature Frond, under side.

ASPLENIUM GERMANICUM.

WEIS.

The Alternate-leaved Spleenwort.

PLATE XLI.—A.

<i>Asplenium Germanicum</i> ,	WEIS. GRAY. NEWMAN. BENTHAM.
“ “	DEAKIN. BABINGTON. MOORE.
“ “	LAMARCK. WILLDENOW. PRESL.
“ “	SPRENGEL. LINK. STURM.
“ <i>alternifolium</i> ,	WULFEN. SMITH. SOWERBY.
“ “	HOOKE AND ARNOTT.
“ <i>Breynii</i> ,	RETZIUS. SWARTZ. SCHKUHR.
“ “	FEE. NYMAN. KOCH. FRIES.
“ “	SVENSK. LEDEBOUR. METTENIUS.
“ <i>murale</i> , var.	BERNHARDI.
<i>Amesium Germanicum</i> ,	NEWMAN.
<i>Phyllitis heterophylla</i> ,	MENCH.
<i>Scolopendrium alternifolium</i> ,	ROTH.
<i>Tarachia Germanica</i> ,	PRESL.

Asplenium—Spleenwort.

Germanicum—Of Germany.

A DWARF and very rare British Fern, growing on rocks at an altitude of from three hundred to a thousand feet above the sea-level, and requiring, under cultivation, a porous soil with stone. The roots require to be moderately moist, and the plant itself moderately dry. A bell-glass with holes at the top will prevent water from injuring the fronds, and still keep the plant sufficiently moist.

It has been found in Cumberland, on Helvellyn and in Borrowdale; in Northumberland, on Kylæ Rocks; in Somersetshire, near Culborne. In Wales, in Denbighshire, near Llanrwst and Capel Curig; in Carnarvonshire, on Llanberris. In Scotland, near Kelso, in Roxburghshire, and near Hassendeen; Fifeshire, near Dunfermline; Perthshire, near Dunkeld and Perth. Mr. P. Neill Fraser gathered it within two miles of Edinburgh in 1857, and Mr. D. Hutchison says it is plentiful on almost inaccessible rocks near Airlie Castle, Forfarshire.

It is found as far north as the Gulf of Finland. In Norway, Sweden, Belgium, Switzerland, France, Hungary, Germany, Croatia, Spain, Italy, Dalmatia, Bukowina, and on the Tyrol and Carpathian Mountains.

It is usually found growing with *Asplenium septentrionale*.

The fronds are linear-oblong, pinnate, or sub-bipinnate.

Pinnæ alternate, ascending, remote, and of a narrow wedge-shaped form. The lower ones three-cleft, entire below, and toothed at the apex.

Length of frond from two to six inches, and pale green in colour.

Stipes slender and terminal, and as long as the frond. Stipes and rachis smooth. Caudex brief, tufted, and scaly.

Veins flabellately forked.

Fructification occupying all the back of the pinnæ. Sori linear-elongate and central. Indusium entire.

This species is not subject to much variation in form, only one variety being known.



Fig. 503.—Frond.

ACUTIDENTATUM, Moore. (Fig. 503.)—An interesting form raised from spores by Mr. Sim, of Foot's Cray. It differs in having the teeth of the lobes acute, instead of obtuse. I am indebted to Mr. Sim, of Foot's Cray, for fronds.



Fig. 504.—Portion of mature Frond, under side.

ASPENIUM SEPTENTRIONALE.

HOFFMANN.

The Forked Spleenwort.

PLATE XLI.—B.

<i>Asplenium septentrionale</i> ,	HULL. SMITH. GRAY.
“ “	HOOKEE AND ARNOTT.
“ “	BABINGTON. DEAKIN. KOCH.
“ “	NEWMAN. SOWERBY. MOORE.
“ “	HOOKEE. BENTHAM. PRESL.
“ “	SCHKUHE. WILLDENOW.
“ “	SPRENGEL. STURM. FRIES.
“ “	LEDEBOUR. METTENIUS.
“ “	NYMAN. E. J. LOWE.
“ <i>furcatum</i> ,	JACQUEMONT.
“ <i>bifurcatum</i> ,	OPIZ.
<i>Acrostichum laciniatum</i> ,	GILIBERT.
“ <i>septentrionale</i> ,	LINNEUS. BOLTON.
<i>Amesium septentrionale</i> ,	NEWMAN.
<i>Blechnum septentrionale</i> ,	WALLROTH.

<i>Scolopendrium septentrionale</i> ,	ROTH.
<i>Acropteris septentrionalis</i> ,	LINK. FEE.
<i>Belvisia septentrionalis</i> ,	MIRBEL.
<i>Pteris septentrionalis</i> ,	SMITH.

Asplenium—Spleenwort.

Septentrionale—Northern.

ALTHOUGH not an uncommon European species, still the *Asplenium septentrionale* is a rare British Fern, of dwarf size and rupestral habit, growing in the fissures of rocks, and on loose stone walls.

We have recorded as localities for this species in Westmoreland, the neighbourhood of Ambleside; in Cumberland, Helvellyn, in the Vale of Newlands, Honiston Crag, Scawfell, Patterdale, Keswick, Wastwater, and Borrowdale; in Northumberland, at Kylæ Crag; in Yorkshire, Ingleborough; in Somersetshire, Culborne, near Oare Church, and Exmoor.

In Scotland, Roxburghshire, Edinburghshire, Perthshire, and Aberdeenshire.

In Wales, near Llanrwst, Pass of Llanberris, Bettwys-y-Coed, Capel Curig, Pont-y-Pair, and Llewellyn.

It does not occur in Ireland.

Abroad it is found in Scandinavia, Russia, France, Belgium, Switzerland, Germany, Hungary, Spain, Portugal, Italy, Northern India, and New Mexico.

The fronds, which are evergreen, are from two to six inches in length, deep green, and coriaceous. Sometimes simple, sometimes forked, and either entire or with a few distant marginal teeth, or divided into several lobes.

The fronds are tapering towards both extremities.

Caudex brief, stout, often densely crowded with fronds.

Stipes usually longer than the frond.

Sori linear, elongate. Indusium entire.

Like all other rock plants it delights best to grow horizontally amongst lumps of porous sandstone in sandy soil.

It does not appear subject to varieties.





Fig. 505.—Portion of mature Frond, under side.

ASPLENIUM FONTANUM.

BERNHARDI.

The Smooth Rock Spleenwort.

PLATE XLII.—A.

<i>Asplenium fontanum</i> ,	BERNHARDI. SMITH. DEAKIN.
“ “	HOOKE AND ARNOTT. MOORE.
“ “	BENTHAM. SOWERBY. BROWN.
“ “	SPEENGEL. SADLER. LINK.
“ “	METTENIUS. E. J. LOWE.
“ <i>Halleri</i> ,	SPEENGEL. SADLER. DE CANDOLLE.
“ “	LINK. KOCH. LEDEBOUR. NYMAN.
<i>Athyrium Halleri</i> ,	ROTH. PRESL. FEE. METTENIUS.
“ <i>fontanum</i> ,	ROTH. SADLER. DE CANDOLLE.
“ “	PRESL. BABINGTON. GRAY. FEE.
<i>Aspidium fontanum</i> ,	SWARTZ. WILLDENOW. SCHKUHR. SMITH.
“ <i>Halleri</i> ,	WILLDENOW. POIRET.
<i>Polypodium alpinum</i> ,	LAMARCK.
“ <i>fontanum</i> ,	LINNEUS. SMITH. BOLTON. POIRET.

Asplenium—Spleenwort.

Fontanum—Fountain.

A DWARF Fern, with bipinnate, narrow, or linear-lanceolate fronds, broadest upwards, rigid and glabrous. Fronds varying from three to twelve inches, usually four or five inches, and dark green in colour.

A very rare British Fern, growing on rocks and walls.

It has been found in Hampshire, near Petersfield, in 1852, by the Rev. W. H. Hawker; in Swanage Cave, Isle of Purbeck, also in 1852, by Dr. Power; in Surrey, near Tooting, in 1845, by Mr. Gibbs. Mr. A. Shepherd records it as found at Matlock; Mr. R. M. Redhead in Wharnccliffe Wood, Yorkshire; Mr. R. Brown near Alnwick Castle, Northumberland; Mr. Hudson (who first discovered it as British) at Wybourn, Westmoreland; Mr. D. Hutchison near Stonehaven, Kincardineshire; and Mr. Newnham at Cavehill, near Belfast.

It is found in France, Belgium, Spain, Italy, Switzerland, Germany, Hungary, Greece, Siberia, and Kashmir.

Readily grown in a well-drained pot, and porous soil of turfy peat, with a slight portion of friable loam and abundance of gritty silver-sand. A greenhouse variety requiring care in not over-watering.

Caudex brief, erect, tufted, and somewhat scaly.

Stipes brief, slender, dark purplish brown, becoming green upwards.

Rachis green, having a narrow elevated margin throughout, reaching nearly to the stipes.

Pinnæ oblong-ovate, spreading, the basal ones smaller, more distant, and palmately three-lobed. The upper ones crowded and oblong.

Pinnules roundish-obovate, tapering to the base; the basal ones stalked, the upper ones decurrent, their margins spinosely-mucronately dentate.

Sori brief, oblong, most copious upwards, but covering the whole under surface of the frond.

Veins consisting of a flexuose costa with alternate simple veins.

There is a form known as *Halleri*, but it is doubtful whether the variation is not owing to cultivation.

There is also another form which Mr. Moore refers to this species known as var. *refractum*, (Plate XLII.—B.) whose history is obscure.

Mr. Moore mentions at page 65, vol. ii., of his "Nature-printed British Ferns," that "it in some respects approaches the North American *Asplenium ebeneum*." I have long considered this Fern to be a variety of *A. ebeneum*; and a letter recently received from Mr. Clapham, of Scarborough, a cultivator of Ferns of great discernment, strengthens my opinion, as he also considers *ebeneum* as the parent of this plant. It is therefore placed as a variety of this Fern with every confidence of having removed it to the right species.



Fig. 506.—Apex.

MULTIFIDUM, *Stansfield*. (Fig. 506.)—A very distinct variety, from five to six inches in length, more or less depauperate below. The pinnæ and pinnules very various in size and form; some of the pinnæ simple, and merely dentate on their edges. About two inches below the apex the main rachis dividing, and these divisions again subdividing, and forming a branching apex. I am indebted to Mr. Clapham, of Scarborough, for fronds.



Fig. 507.—Middle of Frond.

LAXUM, *Stansfield*. (Fig. 507.)—A lax form with alternate pinnæ. Pinnæ ascending, widest in the centre of the frond, contracting to the base and apex, but not so much as in *laciniatum*. Length of frond five inches. Copiously soriferous.



Fig. 508.—Frond.

DEPAUPERATUM, *Stansfield*. (Fig. 508.)—A remarkable variety, introduced and named by the Messrs. A. Stansfield and Sons. Length of frond two inches. The apex of the

frond sharp-pointed. An exceedingly depauperate form, the leafy portion being entirely absent, a brief cornuted footstalk alone being present, surrounded by spore-cases. My thanks are due to Messrs. Stansfield for fronds.



Fig. 509.—Middle portion of Frond.

LACINIATUM, *Stansfield*. (Fig. 509.)—A much cut variety introduced by Messrs. Stansfield, of Todmorden. Length of frond six inches, width in centre one inch, contracting to the base, and attenuately to the apex. Copiously soriferous. The illustration is from Messrs. Stansfield.



Fig. 510.—Apex.

HALLERI. (Fig. 510.)—An interesting variety, more nearly approaching the normal form than any of the before-mentioned

varieties. Usual length of frond four inches; pinnæ approximate, their apices, and also those of the pinnules, more or less rounded. The sori less copious, and mostly confined to the upper portion of the pinnæ and upper half of the frond.



Fig. 511.—Apex of mature Frond.

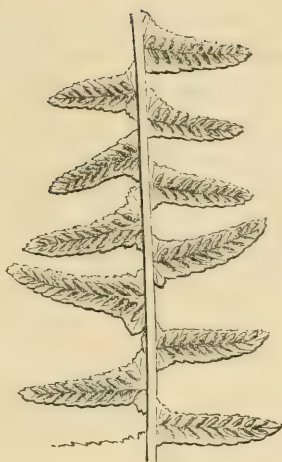


Fig. 512.—Lower portion of younger Frond.

ASPLENIUM EBENEUM.

AITON.

PLATE XLII.—B, VAR. REFRACTUM.

<i>Asplenium ebeneum</i> ,	AITON. LINK. SWARTZ. KUNZE.
“ “	PRESL. WILLDENOW. PLUKENET.
“ “	FEE. A. GRAY. PAPPE AND RAWSON.
“ “	METTENIUS. MORISSON. E. J. LOWE.
“ <i>trichomanoides</i> ,	MICHAUX, (<i>not of</i> LUMNITZER.)
“ <i>polypodioides</i> ,	SWARTZ. SCHUHE.
“ <i>parvulum</i> ,	MARTENS AND GALLEOTTI.
“ <i>resiliens</i> ,	KUNZE.
<i>Acrostichum platyneuron</i> ,	LINNÆUS.

Asplenium—Spleenwort.

Ebeneum—Ebony-stalked.

AN easily-cultivated cool greenhouse Fern from North America, the Cape of Good Hope, Canada, the West Indies and South Africa, and Mexico.

Length of frond twelve to eighteen inches, delicate green, with the rachis and stipes ebeneous.

Fronds smooth, linear-lanceolate, and pinnate.

Pinnæ sessile, imbricated, and oblong, the superior ones auriculate, rounded at the apex, and bluntly crenate on the margins. The inferior ones cordate-hastate.

Caudex stout and horizontal; stipites tufted.

The normal form has not been found in Great Britain, and this species is only added on the supposition that *Asplenium refractum* is a variety of this Fern.



Fig. 513.—Basal portion of young Frond.

REFRACTUM, Moore. (*Asplenium fontanum*, var. *refractum*, Moore and Hooker, *A. fontanum*, var. *proliferum*, Wollaston.) (Plate XLII.—B, and fig. 513.)—First known in 1851, from the gardens at Peper Harrow Park, Surrey, and afterwards introduced by Mr. Parker, of Hornsey. A person named Filden had found three plants in Scotland, but, being since dead, this interesting plant has obscurity cast over it. It has linear sub-bipinnate fronds, with brief, oblong, obtuse, refracted pinnæ, pinnate at the base, and pinnatifid above. Pinnules (the basal anterior one alone distant, the remainder confluent) roundish, having a few coarse, angular, mucronate teeth. Sori brief, oblong-oblique, in a line on either side near the costa of the pinnæ. Rachis chesnut-coloured, marginate above, (not winged,) and bulbil-bearing. Length seven or eight inches, width three quarters of an inch. The frond is longer and narrower in proportion than *Asplenium fontanum*; the outline is different, being equal and linear instead of incurving upwards. The pinnæ are much less divided, and are refracted in a remarkable degree. Little bulbils are formed at the junction of the pinnæ with the rachis.



ASPLENIUM ADIANTUM-VIRGATUM.



Fig. 514.—Lower pinna of the variety *Acutum*.

ASPLENIUM ADIANTUM-NIGRUM.

LINNÆUS.

The Black Maiden-hair Spleenwort.

PLATE XLIII.

<i>Asplenium adiantum-nigrum</i> ,	LINNÆUS. BOLTON. SMITH.
“ *	DEAKIN. BENTHAM. MACKAY.
“ “	DESAUX. HOOKER AND ARNOTT.
“ “	BABINGTON. MOORE. NEWMAN.
“ “	SOWERBY. BORY. SCHKUHR.
“ “	SWARTZ. LAMARCK. SADLER.
“ “	WILDENOW. PRESL. LINK.
“ “	SPRENGEL. KOCH. FEE.
“ “	STURM. LEDEBOUR. FRIES.
“ “	METTENIUS. POLLINI. HENFLER.
“ “	PAPPE AND RAWSON. NYMAN.
“ “	SCHLECHTENDAL. E. J. LOWE.
“ <i>adiantum-lanceolatum</i> ,	HOFFMANN.
“ <i>argutum</i> ,	KAULFUSS. SPRENGEL. PRESL. FEE.

<i>Asplenium acutum</i> ,	BORY. WILLDENOW. NEWMAN.
“ “	BABINGTON. POIRET. SPRENGEL.
“ “	SADLER. PRESL. FEE. LINK.
“ “	METTENIUS.
“ <i>Capense</i> ,	LINNÆUS.
“ <i>multicaule</i> ,	SCHOLTZ.
“ <i>incisum</i> ,	OPIZ.
“ <i>serpentini</i> ,	TAUSCH.
“ <i>fissum</i> ,	WEINM.
“ <i>novum</i> ,	SADLER.
“ <i>cuneifolium</i> ,	VIVIANI.
“ <i>humile</i> ,	BLUME.
“ <i>Heuffelli</i> ,	WIERZB.
“ <i>Davallioides</i> ,	TAUSCH.
“ <i>luridum</i> ,	SALISBURY.
“ <i>nigrum</i> ,	BERNHARDI.
“ <i>Oreopteris</i> ,	LINNÆUS.
“ <i>productum</i> ,	LOWE.
“ <i>patens</i> ,	GAUDICHAUD.
“ <i>Virgilii</i> ,	BORY. GUSSONE.
“ <i>trichomanoides</i> ,	LUMNITZER, (not of MICHAUX.)
“ <i>Silesiacum</i> ,	MILDE.
“ <i>tabulare</i> ,	SCHRADER.
<i>Phyllitis lanceifolia</i> ,	MEENCH.
<i>Tarachia acuta</i> ,	PRESL.
“ <i>arguta</i> ,	PRESL.
“ <i>adiantum-nigrum</i> ,	PRESL.

Asplenium—Spleenwort.

Adiantum-nigrum—The black *Adiantum*.

Asplenium adiantum-nigrum is widely spread throughout England and Wales, Scotland, Ireland, the Western and Channel Isles, occurring on rocks, walls, and sandy banks, from the sea-level to an altitude of almost two thousand feet. It is also found throughout Europe, occurring in Scandinavia. Russia, Denmark, France, Belgium, Germany, Italy, Switzerland, Spain, Portugal, Dalmatia, Croatia, Hungary, Transylvania, Turkey, Greece, Austria, Corsica, Cyprus, the Balearic Isles, Sicily, Teneriffe, Madeira, Azores, Cape de Verd Islands, Algiers, Abyssinia, the Cape of Good Hope, Natal, and St. Helena. It is widely spread in Asia, occurring in Siberia, Russian Asia, Arabia, Armenia, Syria, Affghanistan, Kashmir, Simla, Java, Sandwich Isles, Virginia, and Porto Rico.

A beautiful species, and may be successfully grown in

well-drained sandy soil, amongst rock-work in the open fernery, or under pot-culture in a greenhouse.

The caudex is brief, stout, tufted, and scaly.

Stipes often longer than the leafy portion of the frond, dark purple, and smooth. Rachis channeled in front.

Length of frond from three inches to two feet, and from an inch and a half to seven inches wide at the base; shining deep green above, paler beneath. Deltoid or ovate, and tapering to an acuminate apex; bipinnate, tripinnate, or even subquadripinnate.

Pinnæ oblong-triangular, mostly elongate, and with an attenuated apex. The basal ones the largest and opposite, above alternate.

Pinnules alternate; the basal ones situated on the anterior side of the rachis, and much larger than the others, broadly oblique-ovate, with an attenuated apex, pinnate or pinnatifid at the base, the segments ovate-obtuse. The ultimate divisions notched with distinct acute serratures.

Veins furcate.

Sori linear-elongate, indusiate on the anterior side of the veins near their base, crowded and soon confluent.

Fronde evergreen.

There are a few distinct varieties:—

ACUTUM, Pollini. (Fig. 514.)—Found by Dr. Mackay, Dr. Allchin, and Mr. G. H. Allcock at the Turk Waterfall, Killarney; at the foot of Cromaglaun, and Glouin Caragh, Inveragh, by Mr. G. Maw; Cahir Conree, near Tralee, by Mr. W. Andrews; Dublin Mountains, by Mr. D. Orr; Cork, by Miss Townsend; St. Asaph Cathedral, by Mr. C. Johnson; in Jersey, by M. Piquet; and Combe Royal, South Devon, by Miss Hoseason. In July, 1860, I found this plant in great abundance in Spain, especially near Santander, Las Caldas, and between Reinosá and Allar. In Mr. Sewell's garden at Fuente del Mar, about a mile from Santander, a long bank under a hedge was completely clothed with this variety. A very distinct form, and perhaps even a distinct species. Texture firmer. Length of frond from six to eighteen inches, and two inches and a half to eight inches broad at the base. Stipes sometimes nine inches long. Outline pentangular, and in the larger

fronds subquadripinnate. The lowest pinnæ, which are the largest, are opposite, and of a similar outline to the frond itself. The apices of the frond and pinnules caudate, with a few sharp, deep, and distant teeth. The lower lobes are three-toothed, those above bifid, whilst at the apex only simple toothed. Veins furcate, slender, but very distinct. Sori very narrow, linear, and situated near the centre of the pinnules. It differs from the normal species in being more subdivided, in its thinner and more papery texture, and in the presence throughout of linear-acute erect segments and teeth. For fronds I am indebted to Mr. G. H. Allcock, and to Mr. Joseph Sidebotham.



Fig. 515.—Middle pinnae.

MICRODON, *Moore*. (Fig. 515.)—A distinct variety, found in Guernsey and near Barnstaple by the late Mr. C. Jackson, and in Devonshire by the Rev. J. M. Chanter. Fronds six to eight inches in length, broadest at the base, where nearly three inches across, pyramidal, with an irregular outline, owing to the unequal length of the pinnæ. Pinnæ distinctly pinnate at the base, but slightly adnate and decurrent above, and in the upper part are confluent into a broad irregular pinnatifid apex. The outline of the distinct pinnæ hastate, owing to a rounded auricle, both on the anterior and posterior sides. In the basal pinnæ the auricles become lobes divided half-way down to the costa, above the auricle they taper to an acute point. The margin is everywhere minutely and sharply denticulate. Sori numerous, placed near the costa, mostly scolopendrioid.



Fig. 516.—Apex.

RAMOSUM, *Lowe*. (Fig. 516.)—A very interesting form, found by the Rev. C. Padley, of Beaconfield, Plymouth, near his residence. Fronds bright shining green, very smooth, and of the *obtusum* section; the main stipes branching an inch below the apex, and these again branching two or three times. Pinnules but little divided. Length six inches. My thanks are due to Mr. Padley for fronds.



Fig. 517.—Middle pinnae.

OBTUSATUM, *Moore*. (Fig. 517.)—Comparatively dwarf, being from two to eight inches; and ovate-acuminate in form. The smaller specimens bipinnate; pinnae brief and bluntly triangular, pinnules roundish-obovate and very indistinctly toothed. The larger specimens tripinnate, their primary and secondary pinnules corresponding with the pinnae and pinnules of the small specimens. Found at Sandgate, Kent, Torquay, Wensleydale, Highfield House, near Nottingham, Nottingham Park; in

Scotland near Stirling and Ardrishiag, Argyleshire; in Ireland, Antrim, Newtown Castle, Foynes, and the Isle of Achill; Guernsey.



Fig. 518.—Middle of Frond.

SERRATUM, *Stansfield*. (Fig. 518.)—A pretty, narrow, dwarf form, found by Messrs. Stansfield, of Todmorden. Length five inches, width one inch and a half. Pinnæ small, pinnules very large and finely serrated. The width of the frond almost equal throughout. My thanks are due to Messrs. Stansfield for fronds.



Fig 519.—Middle of Frond.

OXYPHYLLUM, *Moore*. (Fig. 519.)—Found in 1855 near Dunoon, in Argyleshire, by Mrs. East, of Blackheath, and subsequently near Stirling, by Mrs. Macleod. Moderate in size, pinnæ brief, very oblique from the increased size of the basal anterior pinnule, the latter more distant and more distinct than the remainder, which become confluent. Dentation acute, narrow, and large. Not unlike *acutum*, yet the basal pinnæ are sooner smaller than enlarged, as in that form.



Fig. 520.—Apex of Frond.

GRANDICEPS, *Lowe*. (Fig. 520.)—This most remarkable and very rare Fern was discovered in Ireland by the Rev. R. Travers Smith, who found it in an old wall at Tramore, County of Waterford, and gave it to Mrs. B. Hone, of Vevay, Ballybrack, Dalkey, near Dublin. Mrs. B. Hone forwarded fronds and a plant of this singular variety. Length of frond eight inches, width from an inch to an inch and a half, except at the tasselled apex, where it becomes two inches and a half wide. A depauperated variety, occasionally pinnæ opposite, but more frequently the opposite pinnæ absent. Usually only three or four pinnæ, the greater portion of the stipes being naked. Pinnæ leafy, variously cut and differing much from each other in form; and much serrated on the margin. Two inches and a half below the apex of the frond the stipes dilates and becomes flat, and then branches and divides many times, forming a more or less circular tassel termination with a cuneate base. My thanks are due to Mrs. B. Hone for a plant and fronds.



Fig. 521.—Frond.

DEPAUPERATUM, *Moore*. (Fig. 521.)—Found on Whitbarrow, Westmoreland, by Mr. F. Clowes, of Windermere. Dwarf—only two inches high, and the parts all diminutive and irregularly depauperated.



Fig. 522.—Middle pinna.

EDWARDSII, *Lowe*. (Fig. 522.)—Found at Penny Cross, Devon, by Mr. W. Edwards, of Nuttall. Of the *acutum*

section. Rachis very long, being three fourths of that of the frond. Frond broad, pinnæ approximate, the apex abrupt, forming a more or less square termination, instead of the ultimate pinna. I am indebted to Mr. Edwards for fronds.



Fig. 523.—Frond.

FLABELLATUM, *Lowe*. (Fig. 523.)—A distinct form with flabellate fronds. The apex of the frond branching. Pinnæ broad in the barren frond, and very narrow in the fertile ones. I am obliged to Messrs. Stansfield for fronds.

LEPTORACHIS, *Moore*.—A small-fronded interesting form, remarkable for the length of its stipes, and the small size of the parts of its frond. Length of stipes seven inches, slender, the rachis also slender; the leafy portion three inches long, ovate, tripinnate, briefly acuminate. Pinnæ alternate, the basal pinnules of the basal pinnæ broadly and bluntly ovate, and divided into small, thin, obovate wedge-shaped pinnules, which

are somewhat pinnatifid in the upper half; the lobes tipped with two small acute teeth. Abundantly fertile. Found in Glen Urquhart, in the Highlands, by Miss Mc Innes.



Fig. 524.—Frond.

VARIEGATUM, *Wollaston*. (Fig. 524.)—Found in Yorkshire and in Guernsey by the late Mr. C. Jackson. Very rare and beautiful. Normal in outline, and being striped unsymmetrically with white.

OBLONGUM, *Moore*.—Found in Guernsey by the late Mr. C. Jackson. Rendered distinct from the parallelism of the sides of its fronds, which are narrow and oblong. Length of the frond, without the stipes, five inches, breadth at the base

two inches. Pinnæ brief, triangular, acuminate, ascending. The three or four basal pairs nearly equal in size. The subdivisions small.



Fig. 525.—Frond.

SUBCONFLUENS, *Stansfield*. (Fig. 525.)—A dwarf subconfluent form, found by Messrs. Stansfield, of Todmorden. Length three inches. Elongate triangular in form, the pinnæ scarcely divided, and very minutely serrated. The illustration is from Messrs. Stansfield, of Todmorden.



Fig. 526.—Middle pinnæ.

INCISUM, *Clapham*. (Fig. 526.)—Found by Mr. Thompson, about 1859, between Whitby and Scarborough, and presented

to Mr. A. Clapham. A dwarf ovate, or ovate-triangular, tri-pinnate variety. Pinnæ brief, broad, the larger pinnules (and pinnæ) of nearly a deltoid outline; cut into three secondary pinnules, the low lateral ones of which are obovate wedge-shaped, cut into numerous long acute teeth at the apex, the centre one largest. In some fronds the segments are linear. A plant and fronds have been kindly communicated by Mr. A. Clapham, of Ramsdale Bank, Scarborough.



Fig. 527.—Middle pinna.



Fig. 528.—Lower pinna.

INTERMEDIUM, *Moore*. (Figs. 527 and 528.)—Found at Barnstaple by the late Mr. C. Jackson, at Ilfracombe by Mr. J. Dadds, Ottery St. Mary by Mr. G. B. Wollaston, Nettlecombe by Sir W. C. Trevelyan, Sandgate by Mr. S. O. Gray, Moffat by Mr. J. Anderson, Dublin by Mr. R. Barrington, Ballywilliam, Limerick, by Mrs. Barrington, Antrim by Mr. D. Moore, and at Guernsey and Jersey by the late Mr. C. Jackson. Large and lax. It has more elongated and less compound fronds, and the ultimate divisions are broader than in *acutum*. Fronds and pinnæ caudate. Pinnules elongated and acuminate, yet without the linear segments.

ACUTIDENTATUM, *Moore*.—Found at Ilfracombe, Devonshire, by the Rev. J. M. Chanter, and near Nettlecombe, Somersetshire, by Mr. C. Elworthy. A large variety, having caudate divisions, and conspicuous linear-acute teeth, having narrower pinnæ and

broader lobes of the pinnules than *acutum*. Pinnules ovate-lanceolate, profoundly pinnatifid, the lobes narrowly oblong-cuneate. Sori crowded in the centre of the pinnules.

FISSUM, *Moore*.—Found at Combe Royal, near Kingsbridge, South Devonshire, by Miss Hoseason. Very inconstant in form, yet retaining the same general characters. Large. Fronds broadly ovate, occasionally oblong or ramose, or irregular. Usually tripinnate at the base of the pinnules, becoming more and more confluent in the upper parts. Pinnules large, coarse, irregularly developed, having a narrowed cuneate character below, more or less lobed upwards, lobes unequally cut into lengthy linear teeth. Sori confluent, elongate, and sometimes more than half an inch long. Fronds often caudate. The pinnules irregularly cut, and abnormal in appearance.

DECOMPOSITUM, *Moore*, (*Asplenium silesiacum* of Milde.)—Found at Manaton, in Devonshire, by the Rev. J. M. Chanter. Quadripinnate. Resembling *acutum*, except that the ultimate parts, though narrow, are rounded off and blunt, and the texture is more coriaceous. The absence of the linear segments, and the blunt character of the few teeth, cause the form to be distinct.

OBTUSUM, *Moore*.—A wide-spread variety, which is well represented by the figure 524 (*variegatum*,) and therefore needs no illustration.

ADDENDA TO PAGES 171 AND 172.

<i>Asplenium adiantum-nigrum</i> ,	KUNZE. LEDEBOUR. BRACKENRIDGE. (<i>Not of</i> MICHAUX.)
“ <i>argutum</i> ,	GAUDICHAUD.
“ <i>obtusum</i> ,	KITAIBEL. SADLER. POIRET.
“ “	DESVAUX. PRESL. FEE. (<i>Not of</i> METTENIUS.)
“ <i>fissum</i> ,	WIMM. (<i>Not of</i> KITAIBEL, POIRET, SADLER, SPRENGEL, DESVAUX, or FEE.)
“ <i>Forsteri</i> ,	SADLER. (<i>Not of</i> KUNZE.)
“ <i>incisum</i> ,	OPEZ. (<i>Not of</i> THUNBERG, SWARTZ, WILDENOW, POIRET, SPRENGEL, DESVAUX, or KUNZE)
“ <i>multicaule</i> ,	SCHOLTZ. (<i>Not of</i> PRESL or WALLICH.)
“ <i>novum</i> ,	SADLER. (<i>Not of</i> KUNZE.)
“ <i>Serpentini</i> ,	TAUSCH. FEE.
“ <i>humile</i> ,	(<i>Not of</i> SPRENGEL.)
“ <i>davallioides</i> ,	(<i>Not of</i> HOOKER.)
“ <i>lucidum</i> ,	(<i>Not of</i> FORSTER, SWARTZ, SCHKUHRE, WILDENOW, POIRET, SPRENGEL, DESVAUX, PRESL, KUNZE, FEE, HOOKER, METTENIUS, SCHLECHTENDAL, or E. J. LOWE.)
“ <i>productum</i> ,	(<i>Not of</i> PRESL.)
“ <i>patens</i> ,	(<i>Not of</i> KAULFUSS, HOOKER & ARNOTT, SPRENGEL, KUNZE, BRACKENRIDGE, or METTENIUS.)
“ <i>trichomanoides</i> ,	(<i>Not of</i> MICHAUX or KUNZE.)
“ <i>acutum</i> ,	HEWARD. BRACKENRIDGE. KAULFUSS.
“ “	KUNZE. SMITH.
<i>Tarachia obtusa</i> ,	PRESL.

A native also of Norway, Sweden, Albania, Mussoorie, Syria, Erzeroum, Guriel, Caucasus, Macedonia, Naples, Silesia, Bohemia, Saxony, the Canary Isles, and Mascaren Islands.

Twenty varieties have been described, namely:—

<i>Acutidentatum</i> , Moore	page 182	<i>Leptorachis</i> , Moore	page 179
<i>Acutum</i> , Pollini	173	<i>Microdon</i> , Moore	174
<i>Decompositum</i> , Moore	183	<i>Oblongum</i> , Moore	180
<i>Depauperatum</i> , Moore	178	<i>Obtusatum</i> , Moore	175
<i>Edwardsii</i> , Lowe	178	<i>Obtusum</i> , Moore	183
<i>Fissum</i> , Moore	183	<i>Oxyphyllum</i> , Moore	176
<i>Flabellatum</i> , Moore	179	<i>Ramosum</i> , Lowe	175
<i>Grandiceps</i> , Lowe	177	<i>Serratum</i> , Stansfield	176
<i>Incisum</i> , Clapham	181	<i>Subconfluens</i> , Moore	181
<i>Intermedium</i> , Moore	182	<i>Variegatum</i> , Wollaston	180

There are still five varieties that I have been unable to get a sight of, namely:—*Attenuatum*, Moore; *crispatum*, Moore; *elongatum*, Clapham; *furcatum* and *laciniatum*, Moore.

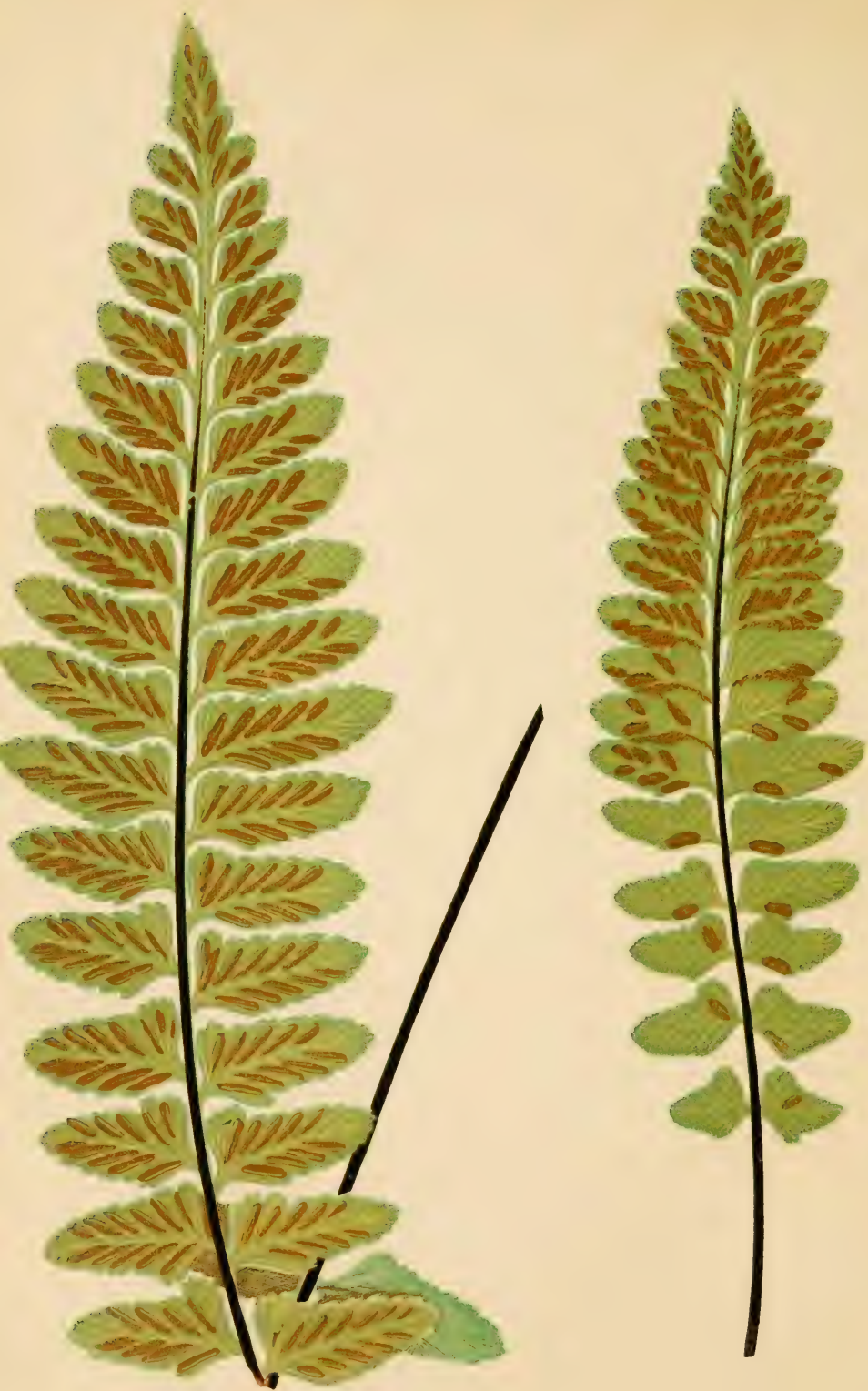




Fig. 529.—Portion of mature Frond, under side.

ASPLENIUM MARINUM.

LINNÆUS.

The Sea Spleenwort.

PLATE XLIV.

<i>Asplenium marinum</i> ,	LINNÆUS. BOLTON. SMITH.
“ “	HOOKE AND ARNOTT. DEAKIN.
“ “	MACKAY. BABINGTON. MOORE.
“ “	NEWMAN. BENTHAM. SOWERBY.
“ “	SCHUHR. WILLDENOW. PRESL.
“ “	SPRENGEL. LINK. METTENIUS.
“ “	FEE. HEUFLER. NYMAN.
“ “	E. J. LOWE. WOLLASTON.
“ “	SWARTZ. DESVAUX. KUNZE.
“ <i>lætum</i> ,	HORT.
“ <i>Tovarense</i> ,	HORT.
“ <i>trapeziforme</i> ,	HUDSON.
<i>Adiantum trapeziforme</i> ,	HUDSON. (The var. <i>trapeziforme</i> .)

Asplenium—Spleenwort.

Marinum—Of the sea.

ABUNDANT along the south-west coast of England and in Wales, growing in clefts and caves of rocks, and mostly by the sea-side.

Common in Cornwall and Devonshire; occurring in Somersetshire, Dorsetshire, Isle of Portland, Isle of Wight, Sussex,

Gloucestershire, (rare,) Cheshire, (at the mouths of the Mersey and Dee,) Lancashire near Warrington, and Newton, (both inland stations.) Yorkshire, (north of Scarborough,) Durham, and Northumberland, Westmoreland, Holy Island, Isle of Man, South Wales—common along the coast, Anglesea, Merionethshire, and Carnarvonshire. In Scotland—Kircudbrightshire, Wigtonshire, Ayrshire, Berwickshire, Edinburghshire, Fifeshire, Forfarshire, Kincardineshire, Aberdeenshire, Argyleshire, Ross-shire, Sutherlandshire, Isles of Bute, Arran, Islay, Mull, Jura, Cantyre; Staffa, Iona, and Skye; on Ailsa Craig, Orkney, Little Barve, Harris, and Shiant Isles. In Ireland—Down, Galway, Dublin, Kerry, Cork, Isle of Rathlin, Arran Isles, abundant along the coast of Connaught and Munster, and in Guernsey and Jersey.

Also found in Spain, Portugal, France, Corsica, Italy, the Ionian Isles, Barbary, Tangiers; Madeira, Azores and the Canary Islands, St. Helena, New Holland, Rio Grande, New Brunswick, Bermuda, and North America.

Caudex tufted and densely scaly. Stipes shorter than the frond, smooth, channeled in front, purplish brown, and terminal. Rachis margined, brown below, winged, and green above. Fronds usually six to twelve inches in length, including the stipites, occasionally less, and sometimes exceeding three feet; smooth, coriaceous, broadly linear, and tapering to the apex; pinnate.

Pinnæ oblong-ovate, or oblong, or linear; oblique, the anterior basal angle being most produced, obtuse, frequently almost equal in width throughout, usually an inch in length, the anterior base truncately rounded into an auricle, the inferior base cut away obliquely in a cuneate manner. The lowest pinnæ stalked, the stalks being winged, the upper ones decurrent, and at length confluent, running together into a tapering pinnatifid apex. The margins doubly and unequally crenato-serrate.

Veins forked from a flexuose midvein.

Fructification spread over the back of the frond. Sori linear, oblique, indusiate, and usually situated on the anterior side of the venules.

An evergreen species, of a deep shining green colour.

Readily cultivated in a frame or cool greenhouse, and will grow well in a damp stove. It is soon killed by frost.

This Fern grows with remarkable luxuriance along the west coast of Ireland, in the County of Clare, where Mr. F. J. Foot, A.M., C.E., of the Geological Survey of Ireland, procured a number of fronds, larger, I believe, than were ever before found in the British Isles. In Burrin, County of Clare, abundant all along the north coast as far as Harbour Hill, near Ballyvaughan, growing in the chinks or open joints of the limestone, attaining a length of three feet, and mostly exceeding two feet, varying considerably in the size and shape of the pinnæ and sori, and closely resembling exotic ones, the *Asplenium lætum*, for instance. Mr. Foot read a paper on the "Distribution of Plants in Burrin, County of Clare," at the Royal Irish Academy, in April, 1862, (see page 143, of vol. xxiv of the Transactions of this Society.)

Few British Ferns make more interesting specimens under pot-culture.

There are some very distinct varieties:—



Fig. 530.—Middle pinnae.

SUBSERRATUM, Stansfield. (Fig. 530.)—Fronds fifteen inches in length. Rachis and stipes ebeneous. Pinnæ lax, narrow, and long, that is, linear-oblong, simple and auriculated, not cut, merely crenate or bicrenate, and minutely serrate at the tip of the crenatures. Sori conspicuous.

ASSIMILE, Moore.—Found in the Channel Islands and at Galway. The fronds are from twelve to fifteen inches long, and

the pinnæ two inches. It resembles *acutum*, differing in having coarse, deeply-serrated, rounded, crenately-dentate lobes.



Fig. 531.—Middle pinnæ.

PARALLELUM, Moore. (Fig. 531.)—Found in Guernsey by M. Boistel. A large variety, the fronds attaining three feet in length. Pinnæ somewhat distant, from two inches to two inches and a half long, and less than three eighths of an inch wide, nearly parallel-sided, the base cuneate, the margin coarsely but not profoundly crenate-serrate. The apex bluntish. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.



Fig. 532.—Pinna.



Fig. 533.—Apex of Frond.

SUB-BIPINNATUM, Moore. (Fig. 532.)—Found in a cave at Petit Bot Bay, Guernsey, by Mrs. Dobree, of the Forest, Guernsey; and also in Cornwall. A much-divided variety. Length of frond seven inches, breadth two inches and a half. Pinnæ distinct, their base obliquely cuneate, and profoundly

pinnatifid, and are more distant from the rachis than is usual with this species. The basal anterior lobes, (that is the largest,) are separated almost to the costa, these lobes being of a narrow oval form; the margin indistinctly serrated. The remaining lobes shorter, yet narrow and deeply divided, having open spaces between them. I believe it is never fertile.

INCISUM, *Moore*. (Fig. 533.)—Found at Great Orme's Head by Mr. A. Stowe, and near Llangollen by the Rev. T. Rooper. A small pretty form, from six to nine inches in length. Pinnæ only half an inch long, very obliquely semi-ovate, truncate, and the anterior base auricled, and having usually three deep incisions along the anterior margin, blunt ended, the posterior side narrow, having a few profound lobes. Sori large and few, mostly situated at the anterior edge of the lobes.



Fig. 534.—Base.

BICRENATUM, *Stansfield*. (Fig. 534.)—A dwarf form from Messrs. Stansfield, of Todmorden. Length six inches. The two basal pairs of pinnæ distant, the others approximate, touching each other. The margin is bicrenate. To Messrs. Stansfield I am indebted for fronds.

PULCHRUM, Moore.—Found on rocks on the bank of the River Dart, near Totness, by Mr. C. Scott. Not unlike *ramosum* in appearance, yet less marked in character. Dwarf, not exceeding eight inches in length. Pinnæ brief, oblong-obtuse, truncate, indistinctly auricled, doubly crenate on the margin, and in mature plants the primary crenatures are so deep as to become sublobate.



Fig. 535.—Middle portion.



Fig. 536.—Apex.

ACUTUM, Moore. (Figs. 535 and 536.)—Fronds two feet long, lax, being distantly pinnate. Pinnæ broadest at the base, and one inch and a half long. The anterior margin auricled, and the posterior side cuneate. The pinnæ gradually narrowing to the apex, which is sharp-pointed. Crenate. Having more acute pinnæ than in the normal form. In the basal half of the frond the pinnæ are shorter, and very variable in shape; in the upper half, except at the apex, longer and narrower. Pinnæ simple. Stipes ebeneous. Found in Jersey and in Guernsey by the late Mr. C. Jackson; Plymouth Hoe by Mr. J. Barker; Dartmouth Castle and Croyde, in Devonshire, by the Rev. J. R. Chanter. The illustration is from Messrs. Stansfield's fronds.

CUNEATUM, *Moore*.—Found in Hulme stone quarry, Winwick, near Warrington, Lancashire, by Mr. T. G. Rylands. Distinct, from its brief, blunt, oblique, trapeziform pinnæ, and from its small, even, deep, rounded crenatures along the margin of the pinnæ. It is not unlike *ramosum* in general outline, yet strikingly distinct in its dentation.



Fig. 537.—Frond reduced.

VARIABLE, *Monkman*. (Fig. 537.)—This is a singular variation of the trapeziform type, and like it grows erect, and is of dwarf habit. Very dark shining green. Found amongst a batch of seedlings (from the Scarborough district) given to Mr. C. Monkman, of Malton, by Mr. A. Clapham, of Scarborough; a precisely similar form was also found by Mrs. Charles Monkman in the summer of 1865, growing high up among the rocks

above the caves at Kynance Cove, near the Lizard, on the Devon coast, as well among the granite boulders as in the fissures of the multi-coloured Serpentine. About one third ramose, the pinnæ being irregularly shortened, or reduced, and frequently wanting. No two fronds alike. A variable ramose form, in which the pinnæ differ much in size and shape, and in which the frond sometimes branches and re-branches several times. Length of frond eight inches, width, across the ramose apex, (when most ramose,) about four inches. The illustration is an exaggerated form sent by Mr. Monkman.



Fig. 538.—Middle pinna.



Fig. 539.—Base.

LAXUM, *Lowe*. (Figs. 538 and 539.)—Found in the Burrin, County Clare, by Mr. F. J. Foot, of the Geological Survey of Ireland. Length of frond from two to three feet, pinnæ very lax, especially on the lower part of the frond. Stipes and rachis very ebeneous. Not unlike *Asplenium lætum* in general appearance. The basal pinnæ an inch apart and smallest at the base, gradually becoming larger to about five inches below the apex, and then slightly narrowing. Scarcely auricled, only shewing traces of this appendage, triangular-elongate near the base, and linear-oblong from the centre of the frond upwards. Simple, with a shallow serrated margin. My thanks are due to Mr. Foot for fronds.





ASPLENIUM MARINUM
 Var. latifolium, x.



A. MARINUM,
 Var. latifolium, x.

INTERRUPTUM, Moore. (Plate XLV.—A.)—I received this form from Messrs. Stansfield, of the Vale Nursery, Todmorden. It differs in its interrupted character, the pinnæ being very various in size and shape. Some elongate-triangular, others elongate-ovate, one pinna being four times the size of the next pinna, and so on. My thanks are due to Messrs. Stansfield for a frond.

RAMOSUM, Wollaston. (Plate XLV.—B.)—Found in 1850, in Dorsetshire, by Mr. G. B. Wollaston, and very distinct. A dwarf Fern, with broad short pinnæ, the basal ones triangular, and as broad as they are long, towards the apex narrower, and slightly elongated, or elongate-triangular. Pinnæ cuneate at their base, with an irregular undulate or broadly crenate margin; the ultimate pinna branching either in the rachis or stipes, and becoming twin-fronded. Sori abundant and conspicuous. My thanks are due to Messrs. Stansfield for fronds.



Fig. 540.—Base.



Fig. 541.—Apex.

TRAPEZIFORME, Clapham. (Figs. 540 and 541.)—Found at Scarborough by Mr. A. Clapham, (the locality, Cloughton Bay, I believe is now destroyed by the falling of the cliffs;) Salcombe, near Kingsbridge, Devonshire, by Mr. T. G. Carter; Torquay, Mr. C. Smith; St. Just, Cornwall, Mr. G. Maw; and in County Down, Mr. Macreight. A dwarfish variety of robust habit. Fronds leathery in texture, and

deep green in colour. Pinnæ brief, rounded but hardly auricled, at the truncate anterior base the lower ones deflexed, trapeziforme, the rest often imbricated. Usually crenately toothed. I am indebted to Mr. A. Clapham, of Scarborough, for plants.



Fig. 542.—Apex.



Fig. 543.—Frond.

CAUDATUM, *Clapham*. (Fig. 542.)—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. A dwarf form. Fronds six or eight inches in length. Pinnæ narrow, giving the frond a somewhat lax appearance. Auricled, except near the apex, though usually inconspicuously so, irregularly toothed. The frond terminating in a long caudate or tail-like apex. I am indebted to Mr. Clapham for fronds.

IMBRICATUM, *Lowe*. (Fig. 543.)—A dwarf form. Length six inches. Raised from spores by Mr. Clift, of Balsall Heath, Birmingham, and now in my possession. The pinnæ are

oblong-ovate, with a small basal auricle; with this exception they are uncut on the margin, merely being minutely serrate. The pinnæ are placed so close to each other that they overlap fully one half of their width, and are consequently very much imbricated; the basal pinnæ are descending, and the remainder slightly ascending; they also arch forwards, so as to place the stipes in a hollow between the row of pinnæ on either side. The frond is equal in width to near the apex, where it rapidly contracts to a blunt decurrent ultimate pinna. Rachis and stipes hirsute. A very distinct form.



Fig. 544.—Frond reduced.

RAMO-TRAPEZIFORME, *Clapham*. (Fig. 544.)—Found by Mr. A. Clapham at Burniston, near Scarborough. A beautiful dwarf multifid variety. The pinnæ small and roundish-trapeziform, usually sharply dentate. Branching at the top of the stipites, or half-way up the rachides, or near

the apex, and the branches dichotomously forked or twice dichotomous. Mr. Moore describes one frond in his "Nature Printed British Ferns," which has the rachis divided about two thirds up; below the ramification are eight small pinnæ, the rachis then divides into five branches of an inch in length, forming a spreading apex two inches and a half broad, and one of these branches is furcate.



Fig. 545.—Lower pinna.



Fig. 546.—Middle portion.

THOMPSONIÆ, Lowe. (Figs. 545 and 546.)—This very distinct Fern was found, I believe, in Devonshire, by the late Mr. C. Jackson, and is now in the possession of Mrs. Thompson, of South Lawn, Exeter, being one of a number of very fine varieties of British Ferns in the possession of Mrs. Thompson. The length is fourteen inches, being widest at the base, and very gradually narrowing to the apex. The pinnæ are alternate, narrow and long, and very conspicuously auricled, especially so in the basal pinnæ; the superior margin is crenate-serrate and bidentate, yet not deeply divided; the inferior margin, on the contrary, is very deeply cut into narrow segments, some of the basal ones being even stipitate with the costa, and as these segments are more or less at right angles to the costa, the plant has a much lacinated appearance in a regular manner. Stipes and rachis ebeneous. I am indebted to Mrs. Thompson for fronds of this very beautiful variety.



Fig. 547.—Frond reduced.

MULTIFIDO-IRREGULARE, *Lowe*. (Fig. 547.)—Fronds of medium size. The pinnae very irregular in size and form, some divided in the basal portion to the base so as to become lobate, others merely conspicuously biserrate; the two basal pairs opposite, then about four pairs opposite, above which subopposite. Some of the pinnae are no larger than the lobes of other pinnae. The apex of the frond multifid.

Nineteen out of the twenty varieties have been described, the only one I have been unable to procure a sight of being *caudiceps* of Moore.

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ADRIANUS VAN NELLE



Fig. 548.—Portion of mature Frond of variety Incisum.

ASPLENIUM TRICHOMANES.

LINNÆUS.

The Maidenhair Spleenwort.

PLATE XLVI.

Asplenium trichomanes,

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LINNÆUS. BOLTON. SMITH.
 HOOKER AND ARNOTT. BABINGTON.
 BENTHAM. NEWMAN. MACKAY.
 DEAKIN. MOORE. SOWERBY.
 SCHKUHR. WILLDENOW. LINK.
 SPRENGEL. SADLER. KOCH.
 FRIES. LEDEBOUR. PRESL. FEE.
 A. GRAY. METTENIUS. HEUFLER.
 NYMAN. PAPPE AND RAWSON.

<i>Asplenium trichomanes</i> ,	E. J. LOWE. OPIZ. WOLLASTON.
“ “	SCHKUHR. HUDSON. SVENSK.
“ “	MICHAUX. SOWERBY.
	(Not of THUNBERG or SOLANDER.)
“ <i>adiantum-nigrum</i> ,	LUMNITZ, (Not of SWARTZ, PRESL,
	WILLDENOW, MOORE, BOLTON,
	E. J. LOWE, Etc.)
“ <i>dichroum</i> ,	KUNZE. PRESL.
“ <i>elachophyllum</i> ,	MUELLER.
“ <i>melanocaulon</i> ,	WILLDENOW. SPRENGEL. PRESL.
“ “	LINK. FEE. POIRET. KUNZE.
“ “	LIEBMANN. (Not of PÆPPIG.)
“ <i>microphyllum</i> ,	TINCO.
“ <i>Newmani</i> ,	BOLLE.
“ <i>saxatile</i> ,	SALISBURY. GRAY.
“ <i>trichomanoides</i> ,	WEBER AND MOHR. WITHERING.
“ “	LIGHTFOOT. DESVAUX.
	(Not of MICHAUX or KUNZE.)
“ <i>Harovii</i> ,	GODRICH.
<i>Trichomanes crenata</i> ,	GILIBERT.
<i>Phyllitis rotundifolia</i> ,	MENCH.

Asplenium—Spleenwort.*Trichomanes*—Maiden-hair.

AN exceedingly pretty rupestral species, found growing on ruins, rocks, and walls, at all elevations from the sea level up to two thousand feet, and most abundant in the west of England.

A very common Fern, found in nearly every part of England, being most rare in the eastern counties. A native also of Wales, the Isle of Wight, in Scotland from north to south, Orkney, Ireland, and the Channel Isles.

Abroad it is in Scandinavia, Russia, Siberia, France, Italy, Switzerland, Germany, Belgium, Portugal, Spain, Turkey, Greece, Persia, Hungary, Sicily, Corsica, Dalmatia, Croatia, Transylvania, Crimea, the Islands of Madeira, Azores, and Cape de Verd; Algeria, Kaffraria, Caucasus, the Ural Mountains, Altai, Baikal, Tauria, Broussa, Karabagh, the Himalaya Mountains, Kashmir, Kunawar, Kumaon, Afghanistan, Bhotan, Simla, Luddak, the Sandwich Islands, Canada, Nootka Sound, the United States, Mexico, New Mexico, Venezuela, Peru, Columbia, Tarapota, Jamaica, Cuba, Australia, Paramatta, and Tasmania.

Mr. W. Andrews, of Dublin, has found examples in the west of Ireland; and Mr. R. Barrington others from Galway that are of great size, more than a foot long, having pinnæ half an inch long and a quarter of an inch broad, and about thirty pairs of pinnæ on each frond.

This Fern is not the easiest of our British species to cultivate in pots. It succeeds best in a compost of porous loamy soil, lumps of sandstone, and lime from old walls. An excess of moisture is fatal to it, nevertheless with proper drainage I have found plunging the pots in leaf-soil is the most successful treatment. When planted in sandy peat or leaf-mould, Mr. G. B. Wollaston has found the plants did not flourish. Planted on rock-work, where it can take its natural position, and its roots can penetrate between the crevices, its beauty is shewn to perfection.

The fronds are linear and pinnate; the pinnæ usually roundish-oblong, obliquely wedge-shaped at the base, and crenated, yet variable in form. The stipes short, smooth, and brown, rounded behind and flat in front, terminal, and adherent to the rhizoma.

Rachis dark brown also. Caudex short and tufted.

The fronds vary from two to eighteen inches in length.

Pinnæ deep green, blunt at the apex, scarcely stalked.

Veins forking from a midvein, and terminating within the margin.

The fructification distributed over the frond. Sori linear, oblique, numerous, indusiate, eventually confluent.

This Fern has some general resemblance to *Asplenium viride*.

There are several varieties, a portion of which are singularly distinct.

INCISUM, *Moore*. (Fig. 548.)—Found in Devonshire by the Rev. W. S. Hore; Kent Clough, near Burnley, Lancashire, by Mr. S. Gibson; in Burrowdale, Cumberland, by Miss Wright. It is also said to have been found in Jersey, and in County Clare. In 1860, Mr. Edmund Thomas Higgins, of No. 18, Kingsdown Parade, Bristol, found a plant near Pyle, in Glamorganshire, which in 1862 was noticed to bear fertile fronds, though sparingly. One of the most beautiful and rare of British Ferns. The fronds are pinnate, and of the ordinary

outline. The pinnæ are somewhat triangular, with acute apices, profoundly pinnatifid, the segments narrow-oblong, or elliptic, mostly acute and irregularly and profoundly serrated, the larger ones often lobate. This variety has always been considered as barren, but recently I have received fertile fronds from Mr. Higgins' plant, and this, I think, is the only instance of the plant being known to be fertile. Length of frond four to six inches. My thanks are due to Mr. Joseph Henderson, of Wentworth, for fronds gathered from an excellent specimen in Earl Fitzwilliam's magnificent collection of Ferns.



Fig. 549.—Frond.



Fig. 550.—Upper portion.

RAMOSUM, *Wollaston*. (Fig. 549.)—Found in Devonshire, at Newte's Hill, near Tiverton, and, somewhat abundantly, near

Ilfracombe, by Mrs. Chanter; in Ireland, on Quin Abbey, County Clare, by Dr. Kinahan; near Windermere by Mr. F. Clowes; near Keswick by Miss Wright; and in Owsnip Gill, Swaledale, by Mr. Robert C. Brown, of Nottingham. A much-branched variety. The rachis is two or three times forked, and the apical lobes often enlarged and bifid or multifid. The pinnæ are not unfrequently irregular or depauperate, and as often conspicuously crenate. The illustration is from Mr. Brown's frond.

BIFURCUM, *Wollaston*. (Fig. 550.)—Found near Maidstone by Mr. G. B. Wollaston; on the wall of Hoddam Kirkyard, in Dumfriesshire, by Mr. W. G. Johnstone; and in Owsnip Gill, Swaledale, by Mr. Robert C. Brown, of Nottingham. Its peculiarity consists in having the apical lobe dilated, and two or three times forked. My thanks are due to Mr. Brown for a plant and fronds.



Fig. 551.—Apex.



Fig. 552.—Apex.

KATASTAKTON, *Lowe*. (Fig. 551.)—An imbricated variety raised from spores at Highfield House. Pinnæ equal in size, except near the base and apex, ovate, with somewhat cuneate base, indistinctly crenate, and imbricated, usually more so than the illustration. Length of frond two to three inches.

RACIMOSUM, *Lowe*. (Fig. 552.)—I have three fronds of this Fern sent to me by Messrs. Stansfield, of Todmorden, under the name of *bifurcum*, but it is obviously distinct from that variety. It is more dwarf. The pinnæ are smaller, and the crested heads of the furcate apex are very compact and leafy.



Fig. 553.—Frond.



Fig. 554.—Frond.

ACROCLADON, *Lowe*. (Fig. 553.)—Found a year ago in Owsnip Gill, Swaledale, by Mr. Robert C. Brown, of Nottingham. A very distinct variety, with fronds about six inches in length. The pinnæ very distant and small. The four basal pinnæ

have the opposite pinnae wanting, above which are about five pairs of lax pinnae, which are subopposite, ovate, with a cuneate base and a rounded dentate apex. An inch below the apex of the frond the rachis divides into three branches, and these again divide, and each terminates in a large ultimate pinna, forming a compact, but not crowded head, of more than an inch across. My thanks are due to Mr. Brown for this plant and fronds.

CORYMBIFERUM, *Lowe*. (Fig. 554.)—Found at Owsnip Gill, in Swaledale, by Mr. Robert C. Brown, of Nottingham. Length of frond six inches. A normal and coarsely crenated form, except that an inch and a half below the apex the stem is frequently naked, above which the rachis branches, and in place of the ultimate pinna there are on each fork two or more connected (and therefore double) large dilated pinnae, or quite divided dilate pinnae, forming a corymbiferous head. My thanks are due to Mr. Brown for this plant and fronds.



Fig. 555.—Base.



Fig. 556.—Middle pinnae.

SERRATUM, *Stansfield*. (Fig. 555.)—Found in County Clare, in 1863, by Mr. A. Stansfield, of Todmorden. Length of frond five inches, width half an inch. Pinnae elongate-oblong, approximate, and serrated on the margin. My thanks are due to Messrs. Stansfield for fronds.

SERRATUM-MAJOR, *Lowe*. (Fig. 556.)—A large form found in 1865, at Shaw Bridge, Devon, by Mr. W. Edwards, of

Nuthall. Length of frond eleven inches, width one inch and a quarter; about twenty-two pairs of pinnæ. Pinnæ lax and unusually large, coarsely serrated, and occasionally dilated or bifid at the extreme tip of the frond. The illustration was forwarded by Mr. W. Edwards, of Nuthall.



Fig. 557.—Middle portion.



Fig. 558.—Middle portion.



Fig. 559.—Apex.

INCISUM-LACINIATUM, Moore. (Fig. 557.)—Found in County Clare, Ireland, in 1863, by Mr. A. Stansfield, of Vale Nursery, Todmorden. Length of frond three inches. A distinct lacinate form of *incisum*. My thanks are due to Messrs. Stansfield, for fronds.

LOBATUM, Moore. (Fig. 558.)—Found in Devonshire by the Rev. J. M. Chanter, and a dwarf form at Ottery St. Mary by Mr. G. B. Wollaston, of Chiselhurst. A large variety, bearing some resemblance to *crenato-lobatum*; the peculiarity consisting in the pinnæ (especially in the centre of the frond) having at their base two deeply-divided broad obovate lobes, the lowest one sometimes separated almost to the midrib. A large form of this Fern was found at Shaw Bridge, Devon, by Mr. Smith, gardener to the Rev. Charles Padley, of Beaconfield, Plymouth. The illustration is from this frond.

SUBÆQUALE, Moore. (Fig. 559.)—Found originally on the banks of the Wye by Mr. J. D. Enys; and more recently at Knaresborough, Yorkshire, by Mr. A. Clapham; Whitbarrow, in Westmoreland, by Mr. F. Clowes; at Nettlecombe, Somers-

setshire, by Mr. C. Elworthy; and at Tunbridge Wells, in Kent, by Mrs. Delves. A handsome form. The fronds are sometimes narrowed and elongated, with the pinnæ distinct; sometimes broad and shorter, with large crowded pinnæ. Differing in a remarkable degree in having the pinnæ equal-sided at the base, the costa and the attachment being central. The upper pinnæ are oblong, the lower ones more frequently obtusely-deltoid, the margins being either slightly sinuated, forming a gently waving line, or deeply crenate-dentate, frequently elegantly crenated. I am indebted to Mr. Elworthy and to Messrs. Stansfield for fronds.

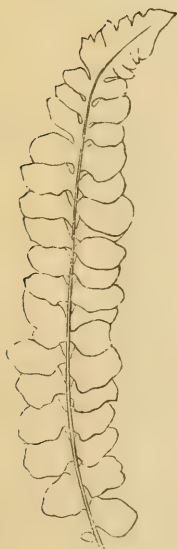


Fig. 560.—Upper portion.



Fig. 561.—Upper portion.

CONFLUENS, *Moore*. (Fig. 560.)—Found at Levens, Milnthorpe, in November, 1865, by Mr. George Stabler, of Levens. Length of frond three inches. A strikingly-distinct form, having crowded

overlapping pinnæ, and a conspicuous confluent apex, hence its appropriate name. For the illustration my thanks are due to Mr. Stabler.

CRISTATUM, *Wollaston*. (Fig. 561.)—Made known by Mrs. Delves, of Tunbridge Wells, having sprung up in a mass of *Hymenophyllum unilaterale* which she received from the Glasgow Botanic Gardens. A pretty Fern, not uncommon in cultivation, of vigorous growth, and easily reproduced by spores. The apex of the frond spreads out into a handsome symmetrical tuft or tassel, and this ramification is confined to the apex of the rachis. Length about three or four inches.



Fig. 562.—Apex.



Fig. 563.—Middle portion.

MULTIFIDUM, *Moore*. (Fig. 562.)—Found at St. Mary's Isle, Kircudbright, by Mr. Dick, and distributed by Mr. J. McNab, from the Edinburgh Botanic Gardens; and lately near Capel Curig, in North Wales, by Mr. S. Clift, of Dalgam. A free-growing interesting form, readily reproduced by spores. The fronds are twice or three times ramosely forked in the rachis considerably below the apex, and the apices of all the branches are dilated and multifid-crisped, forming spreading tufts on the irregular branches. I am indebted to Mr. Clift, of Balsall Heath, near Birmingham, for the illustration.

CORNUTO-RAMOSUM, *Lowe*. (Fig. 563.)—A singular variety found near the Clifton Suspension Bridge by Mr. Edwards, of Nuthall, in 1865. Length of frond six inches. Two inches above the base the rachis divides into two branches, and in the centre of this forking is a cornute projection. The rachis is flexuose, and the one branch is shorter and more slender than the other, with much smaller pinnæ, and a larger decurrent ultimate pinna of half the size of the branch. The pinnæ are lax two or three below the forking, naked immediately above the forking, above which alternate to the apex. The pinnæ vary in size and form, mostly very long and narrow, and auriculate and serrated. Some are cuneate, and a small portion depauperate. The ultimate pinna dilate and bifid. My thanks are due to Mr. Edwards, of Nuthall, for fronds.



Fig. 564.—Frond.



Fig. 565.—Frond.

HAROVII, *Moore*. (Fig. 564.)—This variety was forwarded to me by Messrs. Stansfield, of Todmorden, who had received it from Mr. G. B. Wollaston, and recently a plant nearly identical has come up from spores in my Fernery. A dwarf slender form, with numerous narrow small pinnæ of an elongate-ovate form. Length of frond two to three inches.

RAMO-DEPAUPERATUM, *Clapham*. (Fig. 565).—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Resembling *depauperatum*, except that the rachis divides either near the base or higher up into several branches, and these branches sub-divide, forming an irregular tuft of branchlets varying in number from six to twelve, and most depauperate in these branchlets. The apices of the different portions have dilated obtuse lobes which are almost crispy.



Fig. 566.—Apex.



Fig. 567.—Frond.

BICEPS, *Lowe*. (Fig. 566).—A variety raised by Mr. Mapplebeck, late of Woodfield, Moseley, near Birmingham, and said to be quite constant. Length six to eight inches. Pinnæ approximate, ovate, and minutely crenate. Branching an inch

below the apex, and again branching near the tip into two or three large decurrent ultimate pinnæ. My thanks are due to Mr. Mapplebeck, for fronds.

INTERRUPTUM, *Clapham*. (Fig. 567.)—A pretty variety. Distinct, from the interrupted character of its pinnæ, which are variously formed, some crenate and others lacinate. Sometimes three fourths of the frond will be normal, in others scarcely a single pinna; the pinnæ either absent or depauperated, the few larger ones very narrow and deeply divided, the apex caudate. Length of frond eight inches. I am indebted to Mr. A. Clapham, of Ramsdale Bank, Scarborough, for a plant.



Fig. 568.—Middle portion. Fig. 569.—Middle portions. Fig. 570.—Middle portion.

CRENATO-LOBATUM, *Moore*. (Fig. 568.)—Found at Nettlecombe, in Somersetshire, by Mr. C. Elworthy; and at Mill Slade, near Linton, in Devonshire, by the late Mr. C. Jackson. Vigorous and somewhat normal, with fronds upwards of a foot in length. The pinnæ, however, (which are large, oblong-obtuse,) are profoundly but finely crenate-lobate, giving a uniform-toothed margin to them. My thanks are due to Mr. C. Elworthy for fronds.

DEPAUPERATUM, *Wollaston*. (Fig. 569.)—Found in 1853, in Ireland, at Black Head, County Clare, by Dr. Allchin; and in 1855, at Rydal, in Westmoreland, by Mr. G. B. Wollaston. It is rare, though intermediate forms have been discovered at Firby, in Yorkshire, by Mr. C. Monkman, of Malton, and at Whitbarrow, in Westmoreland, by Mr. F. Clowes, of Windermere. Remarkable for its interrupted or depauperate character. The

pinnæ are very narrow, serrate or laciniate, and near the apex of the frond depauperate, causing the spore-cases to be marginal or apparently to be situated on the upper surface. Sometimes part of the pinnæ are absent, at others the apex of the frond is reduced to a mere winged rib. I am indebted to Messrs. Stansfield, of Todmorden, for fronds.

IMBRICATUM, *Clapham*. (Fig. 570.)—Gathered at Knarbro, in 1863, by Mr. A. Clapham, of Scarborough. A dwarf variety. Length of frond about three inches, with large pinnæ that overlap each other, oblong-ovate, with a square base, having the attachment in the centre, and being distinctly but minutely stalked, the edges of the pinnæ prettily dentate. My thanks are due to Mr. Clapham for fronds.



Fig. 571.—Apex.



Fig. 572.—Apex.

INCISUM-TRIANGULARE, *Moore*. (Fig. 571.)—Found in Ireland, in County Clare, in 1863, by Mr. Stansfield. Another form of *incisum*, having triangular pinnæ. Length of frond four inches. My thanks are due to Messrs. Stansfield, of Todmorden, for examples.

INCISUM-CLAPHAMI, *Lowe*. (Fig. 572.)—Found at Smeersset, near Settle, Yorkshire, by Mr. J. Tatham and Mr. A. Clapham. This variety is included by Mr. Moore under *incisum*. It is a much finer variety than *incisum*, and deserves a distinguishing

mark. I have therefore thought none other would be more appropriate than *Claphami*, after the well-known collector and cultivator of so many fine English varieties. In this variety the pinnæ sometimes measure three quarters of an inch in length, and three quarters of an inch across the base, the basal lobes right and left being cut down nearly to the costa, and themselves lobate, having the segments serrate and the upper lobes cut in proportion. The fronds barren. Length of frond six or seven inches, having upwards of thirty pairs of pinnæ. An exceedingly rare Fern difficult to cultivate. I am indebted to Mr. A. Clapham, of Ramsdale Bank, Scarborough, for an excellent plant with about thirty fine fronds.



Fig. 573.—Middle portion.



Fig. 574.—Middle portion.

RAMO-LOBATUM, Moore. (Fig. 573.)—A large-growing form with fronds seven or eight inches in length, recently found near Nettlecombe, by Mr. C. Elworthy. It is a branched form, with the lobes of the pinnæ divided to the rachides, and the margin coarsely crenated. The illustration is from Mr. Elworthy's frond.

GRANDIDENS, Lowe. (Fig. 574.)—Found in South Devon, by Mr. W. Edwards, of Nuthall, Nottinghamshire. A dwarf form of scarcely three inches in length. Pinnæ various in size and shape, the basal ones auriculate and the upper ones much lacinated, occasional pinnæ are all but absent; copiously sori-ferous. I am indebted to Mr. Edwards, for fronds.

WILLISONII, Willison.—Found near Whitby by Mr. Willison. So nearly allied to the form *confluens* of Moore, as to be doubtfully distinct. I must confess that the only difference

that I detect are the more distant three pairs of basal pinnæ, the more equal sized and shaped pinnæ, and the minutely-crenate margin. A pretty form, of some four inches in length. I am indebted to Mr. Willison, of Whitby, for fronds.

MAJUS, Hort.—A large-growing form found in Devonshire, and in County Clare, and other places. It is of the normal form, with fronds from twelve to eighteen inches in length. I am indebted to the Rev. C. Padley, of Beaconfield, near Plymouth, for a number of Devon fronds, and to Mr. Foot, of the Geological Survey of Ireland, for others from County Clare. An illustration is unnecessary.

CUNEATUM, Lowe.—Raised from spores at Highfield House. Length of frond three inches. The pinnæ are elongate-triangular, broad and flat at the apex, and cuneate at the base. The margin serrated. The ultimate pinna three times the size of the others.

There are yet seven varieties that I have been unable to get a sight of, namely:—*Abruptum*, Moore; *bifurcum-ramosum*, Moore; *crenato-ramosum*, Moore; *dichotomum*, Moore; *incisoblatum*, Sim; *lobatum-ramosum*, Moore; and *varians*, Moore.

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Fig. 575.—Under side of variety Multifidum.

ASPLENIUM VIRIDE.

HUDSON.

The Green Spleenwort.

PLATE XLVII.

Asplenium viride,

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“ “
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“ “

HUDSON. BOLTON. SMITH.
HOOKER AND ARNOTT. BABINGTON.
MACKAY. KUNZE. DEAKIN.
NEWMAN. MOORE. SOWERBY.
BENTHAM. E. J. LOWE. SCHKÜHR.

<i>Asplenium viride</i> ,	WILLDENOW. POIRET. SPRENGEL.
“ “	PRESL. LINK. FEE. KOCH. FRIES.
“ “	LEDEBOUR. STURM. METTENIUS.
“ “	HEUFLER. NYMAN. SWARTZ.
“ “	DESLAUX. GODRICH.
“ <i>intermedium</i> ,	PRESL.
“ <i>umbrosum</i> ,	VILLARS. (<i>Not of KAULFUSS, PRESL,</i> SPRENGEL, KUNZE, J. SMITH, SCHRADER, or METTENIUS.)
“ <i>trichomanes-ramosum</i> ,	LINNÆUS. (<i>Not of WOLLASTON.</i>)
“ <i>trichomanes-elegans</i> ,	SOLANDER.

Asplenium—Spleenwort.*Viride*—Green.

A NEAR ally of *Asplenium trichomanes*, though not nearly so common as that species. It has been found at Danny, in Sussex; Southgate, in Middlesex; Maidstone, in Kent, Mickleham, in Surrey; Ham Bridge, Worcestershire; Dove Dale, Staffordshire; Buxton, Cavedale, and Castleton, in Derbyshire; Beacon Hill, in Leicestershire; Carr-edge, in Cheshire; Staley, Lancashire; in Yorkshire at Settle, Craven, Ingleborough, Gordale, Ais-la-Beck, Richmond, Widdal Fell, in Wensleydale, Ogden Clough, Reeth Moor, in Swaledale, and near Leeds; in Durham at Falcon Clints, in Teesdale, and in Weardale; in Northumberland on the banks of the Irthing; in Westmoreland in Patterdale, Kendal Fell, Hutton Roof, Farlton, Arnside, Casterton Fell, Mazebeck Scar, and Ambleside; in Cumberland at Ashness Gill, Borrow Force, Gillsland, Brandy Gill, Carrick Fell, in Borrowdale. In Wales it is in the counties of Brecknockshire, Glamorganshire, Carnarvonshire, and Merionethshire. In Scotland in Dumfriesshire, Lanarkshire, Stirlingshire, Perthshire, Forfarshire, Nairnshire, Aberdeenshire, Inverness-shire, Argyleshire, Sutherlandshire, and Ross-shire. In the Islands of Arran, Mull, and Shetland. In Ireland in Donegal, near Lough Eske; in Sligo, at Ben Bulgen; in Cork, at Bandon; and in Kerry, at Killarney.

Abroad it is to be found in France, Switzerland, Germany, Belgium, Bohemia, Norway, Sweden, Lapland, Finland, Russia, Dalmatia, Croatia, Spain, Italy, Greece, Tauria, India, Siberia, Island of Sitka, Rocky Mountains of North-west America, Peru, and Columbia.

Found in the moist rocky mountainous districts, growing in the crevices of rocks. Under cultivation it is desirable to have a large quantity of broken stone amongst the soil, and grown in a cool moist situation.

Stipes variable, brown at the base and green upwards. Rachis slender and green, slightly grooved in front.

Fronde varying from two to ten inches in length. Long, linear, pinnate, and pale green.

Pinnæ variable, mostly a roundish-ovate, with a broadly wedge-shaped base, or rhomboidal. Distant and opposite below, alternate and more approximate above.

Veins forking from a midvein, and terminating suddenly within the border.

Sori copious, linear-oblique, indusiate, and soon confluent.

An evergreen species.

There are a few varieties:—

MULTIFIDUM, *Wollaston*. (Fig. 575.)—Found at Settle, in Yorkshire, by Mr. A. Clapham, of Ramsdale Bank, Scarborough; at Whitbarrow, in Westmoreland, by Mr. R. Morris; and at Llanberris, in Carnarvonshire, by Dr. Allchin. It is also common in other places. I gathered a number of plants in 1863, in Teesdale, on the Falcon Clints. Somewhat lax, and bifid or multifid towards the apex.



Fig. 576.—Middle.

Fig. 577.—Base.

Fig. 578.—Frond.

Fig. 579.—Apex.

DELTOIDEUM, *Clapham*. (Figs. 576 and 577.)—Introduced by Mr. Clapham, of Ramsdale Bank, Scarborough. A deltoid form. The pinnæ very large at the base, rapidly becoming smaller

to the apex of the frond, where minute. Pinnæ deeply cut. Sori large and conspicuous. I am indebted to Mr. Clapham, of Ramsdale Bank, Scarborough, for a plant and fronds.

IMBRICATUM, *Clapham*. (Fig. 578.)—A dwarf form of some two inches in length, with imbricate fronds, the apex branching and dilate, and these branches not divided into pinnæ but decurrent. Found by Mr. A. Clapham at Settle. I am indebted to Mr. A. Clapham, of Ramsdale Bank, Scarborough, for fronds.

INCISUM, *Moore*. (Fig. 579.)—Found in Carnarvonshire by Mr. J. Atkins; at Crosby Ravensworth, in Westmoreland, by the late Mr. R. Clarke; on Whitbarrow by Mr. R. Morris; and on Drummond Hill, Perthshire, by Mr. C. McIntosh. Length of frond seven to nine inches. Fronds nearly equal in width from the base to the apex. Pinnæ trapeziform, the margin profoundly cut into blunt teeth in place of the usual crenatures.



Fig. 580.—Apex.



Fig. 581.—Frond.



Fig. 582.—Apex.

CRENATUM, *Clapham*. (Fig. 580.)—Gathered on Pennigent by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Fronds very variable, some lax and some with crowded pinnæ, mostly ramose, and dilated at the apex. In some the pinnæ are interrupted, in others depauperate, in some unilateral, in others lax at the base, often imbricate in the centre of the frond, and depauperate towards the apex. Unlike *deltoideum*, the pinnæ

are smallest at the base, and become larger till within a third of the apex. Pinnæ very various in form; all deeply cut. My thanks are due to Mr. Clapham for fronds.

STIPATUM, *Stansfield*. (Fig. 581.)—Found in 1863 in Scotland, on the Breadalbane Mountains, by Mr. A. Stansfield, Jun., of Todmorden. A dwarf form, with small triangular pinnæ, which are widest at the base, and narrow towards the apex. Conspicuously stipate. Length of frond two inches. My thanks are due to Messrs. Stansfield for fronds.

RAMOSUM, *Stansfield*. (Fig. 582.)—A form found by Messrs. Stansfield, of Todmorden. An interesting variety, the rachis branching in the centre of the frond, and again at the apex. Pinnæ lax below, crowded above. I am indebted to Messrs. Stansfield for fronds.



Fig. 583.—Frond.



Fig. 584.—Frond.

CUNEATUM, *Wollaston*. (Fig. 583.)—Found in Scotland in 1863, on the Breadalbane Mountains, by Mr. A. Stansfield,

Jun., of Todmorden. A dwarf form. Length of frond three inches. Pinnæ cuneate. My thanks are due to Messrs. Stansfield for fronds.

VARIANS, *Moore*. (Fig. 584.)—A singular Fern, with very various fronds, some more or less normal, others interrupted in the pinnæ. The pinnæ absent in part, small, or unusually large in part, the apex occasionally forked, and the ultimate pinnæ very large and dilate. Pinnæ very various in size and form. Length of frond from two to five inches. I am indebted to Mr. Barnes, of Milnthorpe, for a plant of this Fern.

BIPINNATUM, *Clowes*.—Found in 1853 on Whitbarrow, in Westmoreland, by Mr. J. Hudhart, and is in the possession of Mr. F. Clowes, of Windermere. Pinnæ deeply incised in the manner of *Asplenium trichomanes incisum*.

ACUTIFOLIUM, *Gibson*.—Found by the late Mr. S. Gibson. The pinnæ are lanceolate and acute. Very rare.

There is yet another variety, *sphenophyllum* of Moore, which I have not been fortunate enough to get a sight of.

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FRAXINUS VIRGINICA

XLVIII



Fig. 585.—Dwarf Plant.

ASPLENIUM RUTA-MURARIA.

LINNÆUS.

The Wall-Rue Spleenwort.

PLATE XLVIII.

Asplenium ruta-muraria,

"	"	LINNÆUS. BOLTON. SMITH.
"	"	HOOKE AND ARNOTT. BABINGTON.
"	"	BENTHAM. DEAKIN. NEWMAN.
"	"	MOORE. SOWERBY. WILLDENOW.
"	"	SCHKUHR. SPRENGEL, FEE.
"	"	PRESL. LINK. GRAY. KOCH.
"	"	FRIES. LEDEBOUR. METTENIUS.
"	"	HEUFLER. NYMAN. E. J. LOWE.
"	"	KUNZE. SWARTZ. OPIZ. DESVAUX.
"	"	PAPPE AND RAWSON. SADLER.
		(Not of WALLICH.)
"	<i>murale,</i>	BERNHARDI. SALISBURY.
"	"	GRAY. STOKES.

<i>Asplenium Matthioli</i> ,	GASPARRINI.
“ <i>murorum</i> ,	LAMARCK.
“ <i>pygmæum</i> ,	LINNÆUS. (Not BOJER.)
<i>Amesium ruta-muraria</i> ,	NEWMAN.
<i>Tarachia ruta-muraria</i> ,	PRESL.
<i>Scolopendrium ruta-muraria</i> ,	ROTH.
<i>Phyllitis ruta-muraria</i> ,	MENCH.
<i>Acrostichum ruta-muraria</i> ,	LAMARCK. POIRET.
<i>Adiantum pygmæum</i> ,	LINNÆUS.
<i>Asplenium leptophyllum</i> ,	SCHULTZ. (Not of CAVANILLES, ZENKER, or FEE.)
“ <i>multicaule</i> ,	PRESL. HEUFLE.
	(Not of WALLICH or SCHULTZ.)
“ <i>Zoliense</i> ,	KITAIBEL.
<i>Tarachia multicaulis</i> ,	PRESL.

Asplenium—Spleenwort.

Ruta—Rue. *Muraria*—Wall.

A COMMON British Fern, yet less common on the eastern side of England. Delighting to grow on old walls, both brick and stone, and more especially on the northern side, and preferring to mount up the walls as high as possible: this I have seen in many instances. In the drier situations dwelling alone, and in the more moist having as its companions *Asplenium trichomanes*, *Ceterach officinarum*, and *Cystopteris fragilis*. Also found on rocks, church towers, bridges, and ruins.

Found in the Isle of Wight, and North and South Wales. The Island of Anglesea, Priestholme Island. In Sullan, Orkney, Ireland, Isles of Iona, Cantyre, Islay, Harris, Lewis, N. Oist, Arran, on Ailsa Craig, and in Jersey.

Abroad it is a native of Russia, Norway, Scandinavia, Holland, Belgium, France, Spain, Italy, Portugal, Germany, Switzerland, Hungary, Transylvania, Croatia, Greece, Dalmatia, Bohemia, Sicily, Corsica, Turkey, the Crimea, North and South Africa, in Asia, and North America.

A difficult Fern to cultivate, requiring much stone in the soil, and a dry atmosphere.

The fronds, which are deltoid, are bitripinnate, varying from one to six inches in length. In the young state simple and reniform, or trifoliately pinnate, and in this state often fertile.

The pinnæ alternate.

Pinnules obovate or rhomboidal, their base cuneate, and their apex minutely dentate.

Veins repeatedly forked from the base.

Stipes long, smooth, and purple at the base.

Rachis smooth and green.

Caudex brief, tufted, and scaly.

Sori linear.

An evergreen Fern.

There are a few varieties:—



Fig. 586.—Upper portion.



Fig. 587.—Upper portion.

RAMO-DEPAUPERATUM, *Clapham*. (Fig. 586.)—Found at Settle, by Mr. A. Clapham, of Ramsdale Bank, Scarborough. A branched and depauperate form. Stipes exceedingly long. Pinnæ very various in size and form. My thanks are due to Mr. Clapham for fronds.

ATTENUATUM, *Lowe*. (Fig. 587.)—An unusually large-growing form, found in March, 1863, at Athlone, by Mr. F. J. Foot, of the Geological Survey of Ireland, and named *attenuatum* by the suggestion of the discoverer. Fronds from five to six inches

in length, the stipes being four inches. Ramose, and the pinnæ large, laciniate on the apex. A striking form. The illustration is from Mr. Foot's fronds.

PINNATUM, Moore.—Found at Mucruss, Killarney, by Dr. Allchin. Only once pinnate; pinnæ stalked, rhomboidal, and crenate-dentate in the upper half.



Fig. 588.—Frond.



Fig. 589.—Frond.



Fig. 590.—Young Frond.

TRIFOLIATUM, Lowe. (Fig. 588.)—Found at Bittadon, near Barnstaple, Devonshire, by the Rev. F. Mules. A dwarf variety, with small, nearly round pinnules, three on each branch, all briefly stalked. I am indebted to the Rev. F. Mules for fronds.

RAMOSUM, Moore. (Fig. 589.)—Found at Arnside by Mr. J. Crossfield, and at Settle by Mr. A. Clapham. Branching in the stipites, and in the rachides below the pinnules. The pinnules are angular, and occasionally partially depauperated. The illustration is from Mr. Clapham's fronds.

CUNEATUM, Moore. (Fig. 590.)—Found at Stenton Rock, near Dunkeld, Perthshire; and more recently by the Rev. T. Ellacombe, of Bitton Rectory, near Bristol, in his immediate neighbourhood. Mostly merely pinnate, with long, narrow, cuneate-based pinnules, and having numerous long narrow teeth. In large plants the basal pinnæ divide into three pinnules. My thanks are due to Mr. Ellacombe for plants, and to Messrs. Stansfield, of Todmorden, for fronds.

TRIFIDUM, Moore.—Found at Malgwyn Castle, Pembrokeshire, by Mr. W. Hutchison. A dwarf form. The basal pinnæ on lengthy footstalks, small, and very deeply divided into three cuneate segments, their apices blunt, and indistinctly toothed.

SPATHULATUM, Moore.—Found at Town Malling, in Kent, by Dr. Allchin; Marwood, Devonshire, by the Rev. F. Mules; at Settle, Yorkshire, by Mr. A Clapham; at Dunkeld, Perthshire, by the Rev. R. Taylor; and at Fife by Mr. C. Howie. A large vigorous form. The base of the pinnules are narrowed downwards, and with the blunt apex, being spathulate.



Fig. 591.—Portion.



Fig. 592.—Portion.

UNILATERALE, Moore. (Fig. 591.)—Found at Mucruss, Killybegs, by Dr. Allchin; at Black Head, County Clare, by Mr. R. Barrington; and at Chaigeley, near Clitheroe, Lancashire, by myself. The pinnæ are all on one side of the rachis, the rachis often excurrent and hooked at the point; occasionally the pinna becomes an enlarged branch. A very irregular variety.

CRISTATUM, Wollaston. (Fig. 592.)—Found near Ruthin Castle, Denbighshire, by Mr. J. Daniels; near Guildford, Surrey, by Dr. Allchin; and near Tunbridge Wells, Kent, by Mr. G. B. Wollaston. Bipinnate, pinnules narrowish, those at the apex of the frond or pinnæ dilated at their tips, and somewhat crispy. Other forms are more variable, some tasseled at the apex, some with the apical lobes folded on each other. Often the rachis is divided.

ELATUM, *Lang*.—Found at Ennis, in Ireland, by Dr. Allchin; Michelstown Castle, near Cork, by Mr. P. F. Keir; near Athenny, Galway, by Mr. R. Barrington; Keswick, Cumberland, by Miss Wright; and in Dovedale, Derbyshire, by Mr. Wilson. A tall slender variety, bipinnate or subtripinnate. Remarkable for the small and narrowly cuneate pinnules. Mostly blunt and dentate, occasionally truncate and subtrilobate.

DISSECTUM, *Wollaston*.—Found in Devonshire by Mr. G. B. Wollaston; and in Ireland, in County Louth, by the late Dr. Kinahan. A rare form, with elongated and deeply-incised pinnules.

VARIABLE, *Moore*.—Found at Settle, in Yorkshire, by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Subtripinnate and very variable. Usually the pinnules are obovate wedge-shaped, distant, spreading, with the apex inciso-dentate, occasionally much depauperated. The pinnæ and pinnules exceedingly dissimilar, the pinnules very small, and having two or three horn-like lobes in the place of teeth.

SECTUM, *Moore*.—Found at Arnside by Mr. J. Crossfield. Dwarf, with the ends of the pinnules incised, two or three of the segments usually longer than the others, and producing a forked or lacinated appearance.

PROLIFERUM, *Wollaston*.—Found near Guildford, in Surrey, by Dr. Allchin. A proliferous variety, having young plants situated in the axils of the pinnules. Rare.

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<i>Cristatum</i> , <i>Wollaston</i> . . .	225	<i>Sectum</i> , <i>Moore</i> . . .	226
<i>Cuneatum</i> , <i>Moore</i> . . .	224	<i>Spathulatum</i> , <i>Moore</i> . . .	225
<i>Dissectum</i> , <i>Wollaston</i> . . .	226	<i>Trifidum</i> , <i>Moore</i> . . .	225
<i>Elatum</i> , <i>Lang</i> . . .	226	<i>Trifoliatum</i> , <i>Lowe</i> . . .	224
<i>Pinnatum</i> , <i>Moore</i> . . .	224	<i>Unilaterale</i> , <i>Moore</i> . . .	225
<i>Proliferum</i> , <i>Wollaston</i> . . .	226	<i>Variabile</i> , <i>Moore</i> . . .	226
<i>Ramo-depauperatum</i> , <i>Clapham</i>	223		

GENUS VIII.

SCOLOPENDRIUM. SMITH.

CAUDEX brief, stout, erect, or decumbent, and rarely sub-creeping, an illustration of this rare character being represented in Plate XLIX.

Fronds thick, herbaceous, and in the normal form simple; but the varieties are so numerous that the departures from the usual form must be mentioned when describing each variety.

Sori indusiate, linear, frequently elongated, situated close together in parallel pairs.

Indusium membranaceous, twin, the twin sorus opening along the centre.

Veins forked from a central costa, and terminating within the margin in club-shaped apices.

Scolopendrium is confined to one species in Great Britain, namely, *Scolopendrium vulgare*, and is a small genus in any country. The late Sir W. J. Hooker, in his "Species Filicum," gives the following:—

- 1.—Vulgare, *Smith*. Europe.
- 2.—Hemionitis, *Swartz*. South of France.
- 3.—Pinnatum, *J. Smith*. Luzon.
- 4.—Brasiliense, *Kunze*. Brazil.
- 5.—Douglasii, *Hooker*. Brazil.
- 6.—Nigripes, *Hooker*. Mexico.
- 7.—Rhizophyllum, *Hooker*. United States of America.
- 8.—Sibirica, *Hooker*. Siberia.

In the foregoing are included the genus *Antigramme* of Presl, the genus *Camptosorus* of Link, and the genus *Schaffneria* of Fee.

Scolopendrium Durvillei of Bory, Mr. J. Smith considers as merely a form of *Stenochlæna scandens*; and *Scolopendrium Krebsii* of Kunze, Sir W. J. Hooker refers to *Lomaria punctulata*.





Fig. 593.—Middle portion.

SCOLOPENDRIUM VULGARE.

SMITH.

The Common Hart's-tongue Fern.

PLATES XLIX, L, LI, LII, LIII, LIV, LV, LVI, AND LXIV B.

<i>Scolopendrium vulgare</i> ,	SMITH. SYMONS. GRAY. CURTIS.
" "	MACKAY. BENTHAM. E. J. LOWE.
" "	HOOKE AND ARNOTT. BABINGTON.
" "	DEAKIN. NEWMAN. MOORE.
" "	SOWERBY. NYMAN. WOLLASTON.
" "	FRANCIS.
" <i>officinatum</i> ,	SWARTZ. SCHKUHR. WILLDENOW.
" "	SPRENGEL. PRESL. HOOKER.
" "	LINK. KOCH. FRIES. LEDEBOUR.
" "	FEE. GRAY. METTENIUS.
" <i>Pennsylvanicum</i> ,	OF HORT.
" <i>phyllitis</i> ,	ROTH.
" <i>Lindeni</i> ,	HOOKE.
" <i>officinale</i> ,	DE CANDOLLE. DESVAUX.
" <i>lingua</i> ,	CAVANILLES.
" <i>minus</i> ,	FEE.
" <i>scolopendrium</i> ,	NEWMAN.

<i>Asplenium elongatum</i> ,	SALISBURY. (<i>Not of</i> SWARTZ, POIRET, WILLDENOW, SPRENGEL, DESVAUX, PRESL, KUNZE, FEE, <i>or</i> J. SMITH.)
“ <i>scolopendrium</i> ,	LINNÆUS. BOLTON.
<i>Blechnum linguifolium</i> ,	STOKES.
<i>Phyllitis scolopendrium</i> ,	NEWMAN.
“ <i>polyschides</i> ,	RAY.
“ <i>crispa</i> ,	J. BAUHIN.
“ <i>multifida</i> ,	GERARD.

Scolopendrium—Derived from *Scolopendra*, a genus of myriapods, because the lines of fructification resemble these many-legged crawling animals. *Vulgare*—Common.

THIS elegant Fern is an inhabitant of moist shady banks and woods, delighting to grow amongst underwood; also on damp rocks, walls, ruins, bridges, and the mouths of old wells and caves.

Spread throughout England, Scotland, Ireland, and Wales, yet more or less local. It is most abundant in Ireland and the Channel Isles, owing to the more humid climate, and less abundant in Scotland than in England. Found at all altitudes up to six hundred feet, from the sea-side to the most inland situations; at Scarborough and Morecambe Bay, for instance, growing on the rocks exposed to the sea.

It is a native of the Island of Gothland (in the Baltic,) Russia, Holland, France, Italy, Switzerland, Belgium, Spain, Germany, Portugal, Turkey, Greece, Dalmatia, Algeria, Madeira, the Azores, Caucasus, Ural Mountains, Turcomania, Erzeroum, Persia, United States of America (not common,) Mexico, Orkney, and Shetland.

The *Scolopendrium vulgare* from its distinct character, cool, refreshing-looking fronds, and elegant appearance, is deservedly a general favourite, and very largely cultivated in our Ferneries, and when planted *en masse* produces a pleasing feature, its simple fronds contrasting greatly with the species having much divided fronds.

It is successfully cultivated in a mixture of loam, peat, and sand; and under pot-culture it is essential to secure good drainage. It is readily propagated from divisions, and is easily reproduced from spores.

I found very few plants in Northern Spain, a few specimens being now and then met with at Santander, and here and there along the passes between Las Caldas and Reinosa. In the neighbourhood of Nottingham it is only met with clothing the sides of wells, and on rocks more especially near Bramcote; at Matlock and Cromford, in Derbyshire, and at Chaigeley Manor, Lancashire, it is abundant in damp woods—very different situations to the exposed cliffs at Scarborough Castle, or the low banks close to the sea at Morecambe Bay.

Being very hardy and evergreen are other recommendations to its cultivation as regards its normal form, then again the immense number of extraordinary varieties have among them scores of beautiful and remarkable dissimilarities.

The normal fronds are broadly-linear or oblong strap-shaped; entire, with an attenuated apex; base caudate. Stipes scaly.

Caudex brief, thick, and tufted, with a scaly crown.

Stipes usually one third the length of the frond.

Length of frond from two inches to above two feet, deep rich green, and fleshy in texture. Fructification abundant, usually most so towards the apex.

Sori linear, oblique, and growing in pairs.

The varieties are so numerous, and their characters so distinct from the normal form, that a description of the usual frond gives a very inadequate idea of this remarkable species. We shall therefore at once proceed to describe this numerous family of departures from the normal form.

CRENATO-LOBATUM, Moore. (Fig. 594.)—A large-growing elegant variety found at Ilfracombe, Devon, by the Rev. J. M. Chanter; at Barnstaple by the late Mr. C. Jackson; Saltwood, Kent, by Mr. F. Brent; at White Waltham, Berkshire, by Mr. D. Maher; at Castle Howard, Yorkshire, by Messrs. Stansfield; at Coxwold and Mowthorpe Dale, Yorkshire, by Mr. C. Monkman; at Whitby, by Mr. W. Willison; and in Guernsey by the late Mr. C. Jackson, and by Mr. J. James, of Vauvert. The size and outline of this Fern is normal, sometimes, however, as in the Oldstead examples, being widest at the centre of the frond. The margin (and more especially in the upper portion) is distinctly crenato-lobate, and occasionally



Fig. 594.—Frond.

subundulate. Sori abundant and prominent beneath, and distinctly suprasoriferous above, the latter often large. Length of frond from twelve to fifteen inches. The specimen illustrated was found at Oldstead, Yorkshire, and communicated by Mr. C. Monkman, of Malton.

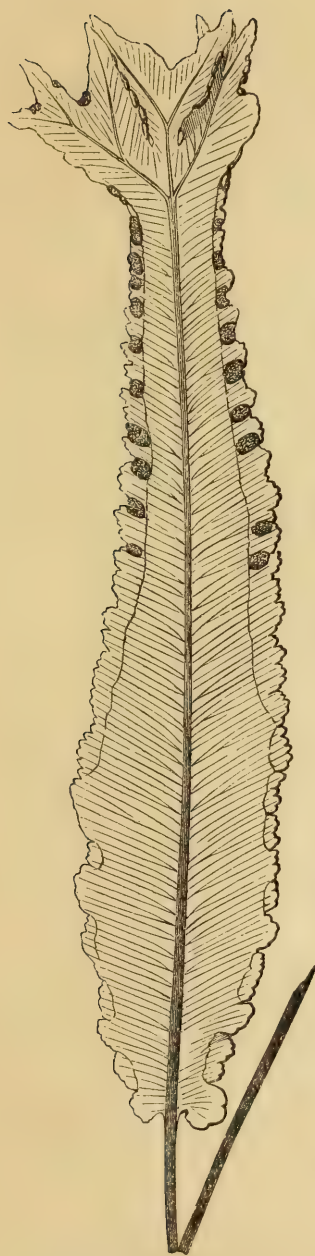


Fig. 595.



Fig. 596.

SUBMARGINATO-MULTIFIDUM, Moore. (Fig. 595.)—A handsome variety found at Hackness, near Scarborough, by Mr. A. Clapham. Marginate almost continuously but near the margin, and irregular. Fronds exceeding twelve inches in length, and one inch and a quarter in width. Cordate at the base, irregularly lobate and sinuous on the margins. Multifid, with a tuft of many small dilated segments at the apex. In the fertile portions the margin is lacinate-dentate. The illustration is from Messrs. Stansfield, of Todmorden.

CRISPUM-LATUM, Moore. (Fig. 596.)—Found at Barnstaple, in Devonshire, by the late Mr. C. Jackson; and at Nettlecombe, Somersetshire, by Mr. C. Elworthy. Differing from *crispum* in the great breadth of its fronds, which are from three to four inches across, and slightly broadest in the centre. The base cordate. My thanks are due to Mr. C. Elworthy for a plant, and to the Rev. C. Padley, of Beaconfield, Plymouth, for fronds.

POCILLIFERUM, Moore.—Found in Guernsey by Mr. J. James, of Vauvert. Of large size. Irregularly lobed, and thick and rigid. Frequently forked, somewhat supra-marginate, occasionally contracted or sublaciniate on the margin. Its peculiar feature consists in the cup-shaped or trumpet-shaped excrescences, (often a quarter of an inch in length,) which are situated irregularly on the under surface of the fronds. The fronds are occasionally lacinate, lobed or in some degree submarginate. Mr. C. Monkman, of Malton, has found a variety having sinuate lobes with very irregular veins, at Crambe, near Malton. I am indebted to Mr. James for fronds.

PAPILLOSUM, Moore. (Fig. 597.)—A pretty, curious Fern, discovered in Guernsey by the late Mr. Jackson. The distinctive feature is a series of distinct wart-like excrescences on the upper surface of the frond, near the margin, forming a kind of border. Sori oval. Length from six or eight inches to eighteen inches. For the frond illustrated I am indebted to Mr. Stansfield, of Todmorden.

TRANSVERSO-LOBATUM, Moore. (Fig. 598.)—Found at Nettlecombe by Mr. C. Elworthy; near Doncaster by Mr. S. Appleby;

and at Castle Howard and Gordale Scars by the Messrs. Stansfield, of Todmorden. A form of *lobatum*, having the



Fig. 597.—Upper side.



Fig. 598.

apical lobes curved laterally so as to cross each other. The lobes are usually again lobate at the apex. Mostly ramose and crenately-lobate on the inner side.



Fig. 599.

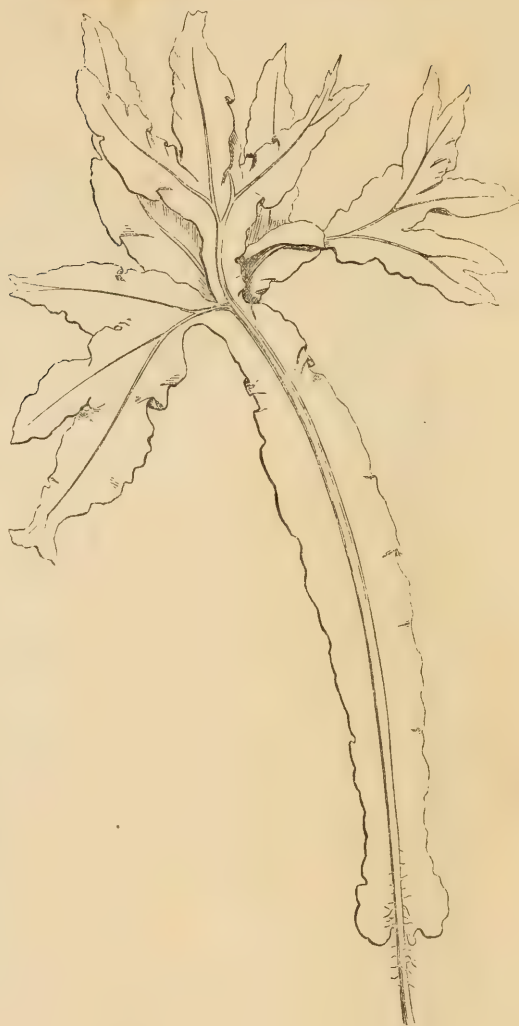


Fig. 600.

PERAFERUM, *Wollaston*. (Fig. 599.)—Found in Ireland by Dr. Allchin, and almost constant. Peculiar from a curious pouch, which is produced at the blunt apex of the frond. Length from six to twelve inches; two inches broad. Cordate at the base,

subundulate; here and there lobed or laciniate-dentate, and submarginate. The apex rounded; somewhat lobate, the costa not extending to the margin, but developed in a leafy or marginate manner into a small pouch, which is occasionally fertile. The costa is occasionally prolonged as a horn through the marginate apical membrane which forms the pouch.

ACROCLADON, *Lowe*. (Fig. 600.)—Found near Ambleside by myself, in 1857. Fronds normal, except the wide-spreading finger-like multifid apex, from which its name is taken. It is a somewhat variable form; sometimes scarcely a frond is more than partially branched, whilst in another every frond will be beautifully characteristic. Length of frond twelve inches.

CRISTATUM, *Moore*. (Plate L—A.)—A very handsome variety of the *Scolopendrium vulgare*. The fronds are multifid, very much divided, and forming large tasseled heads; the divisions at the apex angular. Length of frond six or eight inches. There are several sub-forms of this Fern in cultivation. For fronds my thanks are due to Mr. Wollaston, of Chiselhurst, and Mr. Stansfield, of Todmorden. The illustration is from a plant in my own collection.

RENIFORME, *Williams*. (Plate L—B.)—The *Scolopendrium reniforme* is one of the curious and highly capricious forms of the variety *variabile* of Moore. It was gathered in Devonshire, in 1850, by Mr. D. Hillman, and has also been found at Oldstead by Mr. C. Monkman, and in the Channel Islands by Mr. James, of Vauvert. The fronds are abrupt, and often truly kidney-shaped. Other forms of fronds are occasionally produced variously lobed, and others again approaching the normal form. The veins radiating from the top of the stipes, twice furcate, and free. Sori normal. Length of frond from one to four inches, breadth from one to two inches. For plants my thanks are due to Mr. James, of Vauvert, and for fronds to Mr. Stansfield, of Todmorden.

CORNUTO-ABRUPTUM, *Moore*. (Fig. 601.)—Found at Rivaux Abbey, Yorkshire, by Mr. C. Monkman, of Malton. A constant form, with fronds six inches in length, and two inches and a

quarter in breadth. Subundulated, and somewhat irregular on the margin, abruptly rounded at the apex, and slightly lobed. The central portion has a crenate margin. It is cornute, as in *cornutum*. My thanks are due to Mr. Monkman for fronds.

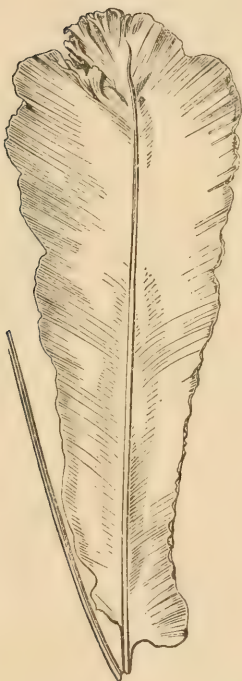


Fig. 601.



Fig. 602.

POLYCUSPIS, Moore. (Fig. 602.)—Of unknown origin. Normal below, and multifid at the apex, this branching tuft being very broad and much divided. The ultimate divisions are of large size, from half an inch to an inch long, flat, and tapering off to a narrow acute point, instead of being dilate and cristate. It is confused with *cristatum* and *multifidum*.

CONSTRICUM, Moore. (Fig. 603.)—Found in Guernsey by Mr. J. James, of Vauvert. Fronds (excluding the stipites) six inches in length. Cordate at the base, and then forming a pair of enlarged lobes, then contracted, becoming less so upwards, but having rounded projecting lobes. Where contracted it is lacinate and marginate. The illustration is from Mr. James.



Fig. 603.



Fig. 604.

SAGITTATO-CRISTATUM, Clapham. (Fig. 604.)—A handsome and somewhat variable form. Found in abundance in Raincliff Wood, near Scarborough, by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Fronds of medium size, being sagittate at the base, the enlarged lobes occasionally directed upwards. The margin rather undulate and irregular, or here and there having several conspicuous lobes, or a branching costa. The apex of

the frond multifid, and somewhat crested. My thanks are due to Mr. Clapham for fronds.



Fig. 605.—Apex.

CRENATO-MULTIFIDUM, Moore. (Fig. 605.)—A handsome form of the Hart's-tongue Fern, gathered by several persons in various limestone districts. Crenate on the margins, with a marginal line on the under surface, and multifidly furcate at the apex. Narrow, and the apices pointed. Very scaly, especially near the midrib. Length from twelve to twenty-four inches, and from one inch to one inch and a quarter broad. To Mr. Stansfield, of Todmorden, my thanks are due for fronds.

MULTIFORME, *Wollaston*. (Fig. 606.)—A permanent form. Found in Guernsey by Dr. Allchin. A singularly compound variety. The stipites single or ramose. Fronds of various sizes, the base cordate, or unequal, or truncate; the apex simple,



Fig. 606.



Fig. 607.



Fig. 608.

lobate, or multifid, occasionally cornute; the surface marginate, or supralineate, or undulate; the margin subentire, crenate-lobate, or laciniate, frequently depauperated in part. It combines the varieties of nearly every known form.

RUGOSUM, *Allchin*. (Fig. 607.)—A curious variety found in

Ireland by Dr. Allchin. Fronds remarkably smooth. Stipes usually very long and almost destitute of scales, the leafy portion comparatively short, seldom exceeding three or four inches, often only an inch, the stipes being from four to ten inches long. Base cordate, apex obtuse, the margin undulated, lobed or contracted, and laciniately or crenately dentate. Fronds irregularly marginate, especially towards the base; at the apex of the costa often an irregular pouch-like development. The costa on the upper surface raised, and broken up into little irregular excurrent points, and forming a muricate ridge, the under side frequently excurrent in the form of a horn. Fertile in the upper part of frond, and the pouch also fertile.

IRREGULARE, *Moore*. (Fig. 608.)—Found in Guernsey and in Devonshire by the late Mr. C. Jackson. Abnormal fronds of eight or ten inches in length, are divided almost to the costa into a series of irregular lobes, which are unequally incised or lobate, having ultimate segments variously shaped. The shallower portions are crenately dentate, the margin subundulate. The costa frequently forked or branched. Veins reticulated or disarranged. Sparingly fertile, with irregular sori. A curious subpermanent form, having normal and abnormal fronds. An elegant monstrosity. My thanks are due to the Rev. C. Padley, of Beaconfield, near Plymouth, for fronds.

MARGINATUM, *Moore*. (Fig. 609.)—Found at Nettlecombe by Mr. C. Elworthy; near Selworthy, Somersetshire, by Mrs. Archer Thompson; at Minehead, Somersetshire, by Mr. W. Bowden; at Ilfracombe and Combe Martin by the Rev. J. M. Chanter; Enys Penryn, Cornwall, by Mr. G. Dawson; at Littlehampton, Sussex, by Mr. G. B. Wollaston; at Stroud, in Gloucestershire, by Mr. W. M. Cooper; at Grassington, in Wharfedale, Yorkshire, by Mr. A. Clapham; in the Isle of Wight by Mr. R. Bloxam; and in Guernsey by Mr. J. James. Fronds erect, exceeding a foot in length, and about an inch in breadth, the base subtruncate, and the apex attenuated, the margin being irregularly lobed, and dentate. On the under surface is an excurrent membrane within the margin, which is also lobed. The frond has thus a double margin, and both surfaces of the



Fig. 609.

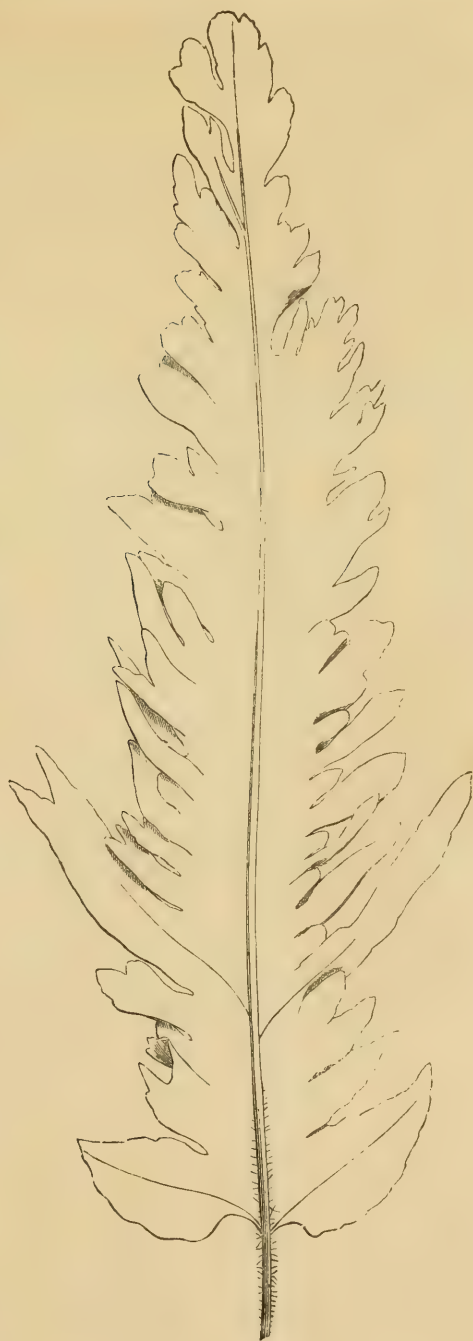


Fig. 610.

membrane, as well as the under surface of the frond exterior to this membrane, are soriferous. Mr. G. B. Wollaston has in his possession a variety with multifid apices.

LACERATUM, *Moore*, (*palmatum*, *serratum*, and *endiviæfolium*, of Gardens.) (Fig. 610.)—An exceedingly fine form found at Taunton, in Somersetshire, by Mr. J. Young; and in Yorkshire by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Fronds variable, frequently short and broad. Length six to ten inches, breadth above the still wider base three inches. Sub-deltoid, the margin profoundly inciso-lobate, the lobes being crowded, elongate, tapering, or multifid-criped at their apices; occasionally longer and narrower, with (on either side of the base) elongate branch-like lobes, and being in fact hastate; the margin inciso-lobate, with narrow elongate tapering and projecting lobes. The apex either slightly or densely multifid-criped. The basal lobes are occasionally four inches long, an inch wide, and expanded into a multifid cristate tuft almost two inches in width. This variety is known by its numerous projecting lobes, its profoundly-cut subpinnatifid margin, and multifid criped character. My thanks are due to Mr. Clapham, of Scarborough; Mr. E. Cooling, of Derby; Mr. Edwards, of Nuthall, Nottinghamshire; and to Mr. Clift, of Balsall Heath, near Birmingham, for plants; and to Mr. Monkman, of Malton; Mr. Elworthy, of Nettlecombe; the Rev. C. Padley, of Beaconfield; and Mr. Swynfen Jervis, of Darlaston Hall, near Stone, Staffordshire, for fronds.

SUBPINNATUM, *Moore*. (Fig. 611.)—Found at Ilfracombe, Devonshire, by Mr. J. Dadds. A singular dwarf variety of the *variabile* section. Fronds six inches in length, and almost two inches broad. The fronds are split to the costa into several irregular rounded wedge-shaped lobes, often distant, with an open sinus occasionally overlapping. Base unequal, the costa near the centre often for the length of an inch bare, so that the lamina is separated.

SUBCORNUTUM, *Tait*. (Fig. 612.)—Introduced by Mr. A. Tait, of Edinburgh. A handsome form, with rigid, coriaceous, upright-growing fronds. Length six to eight inches, somewhat



narrow, crenate, or split into narrow rounded lobes. The apex of the frond abrupt and rounded. The costa sometimes excurrent near the apex, forming a horn on the under side.



Fig 611.



Fig 612.

The fronds are occasionally branched in various ways. Sori sparingly scattered. Mr. A. Clapham, of Ramsdale Bank, Scarborough, has raised some distinct and interesting forms from spores of this variety.

RAMO-MARGINATUM, *Clapham*. (Plate LI.)—This very singular Fern was raised from spores by Mr. A. Clapham, of Scarborough, a gentleman who has perhaps been more successful than any one else in obtaining remarkable varieties of British species from spores. It is exceedingly beautiful and very distinct. The lower portion of the frond is very much narrowed, the leafy part being

often all but wanting, except at the base itself, where it becomes dilated; above it is ramose, forming multifid-crisped tassels, which are marginate. At the apex the form is that of a large spreading tassel. Length of frond varying from nine to twelve inches, and width of the apex (that is, of the tassel) about six inches. There are two forms, the one branching into two distinct fronds at the base. Mr. C. Elworthy has more recently raised a similar form from spores. For the simple form I am indebted to Mr. Stansfield, of Todmorden, and for the double form to Mr. C. Monkman, of Malton, both of whose forms I have figured. My thanks are due to Mr. Clapham for plants.



Fig. 613.

EDWARDSII, *Lowe*. (Fig. 613.)—A diminutive form of *cris-tatum* found by Mr. Edwards, of Nuthall, Nottinghamshire, in Devonshire. It closely resembles the variety known as *cris-tatum* of Veitch, except in being much more diminutive. It is a fine corymbiferous form. The illustration is from Mr. Edwards' plant.

BICEPS, Lowe. (Fig. 614.)—Another of the *variabile* section found at Littleham, in Devonshire, by the Rev. C. Padley, of Beaconfield, Plymouth. Subpermanent. Undulate, with thin fronds facing each other, the one being much shorter than the other. A dwarf form. The illustration is from Mr. Padley's frond.



Fig. 614.



Fig. 615.

DUPLEX, Lowe. (Fig. 615.)—Found at Littleham, Devonshire, by the Rev. C. Padley, of Beaconfield, near Plymouth. Of the *variabile* section, and subpermanent. Lobate and branched, and of an upright habit. Occasionally the fronds are very distinct. My thanks are due to the Rev. C. Padley for fronds.

ACANTHODES, Lowe. (Fig. 616.)—A fine form, found in Devonshire by Mr. Edwards, of Nuthall, Nottinghamshire. In some respects this form resembles *sagittato-cristatum*, but having a larger multifid head. The base, though sagittate, is not conspicuously so, and is not cristate-sagittate. The margin of the

frond has here and there thorn-like projections, especially in the upper half of the frond. I am indebted to Mr. Edwards for fronds.

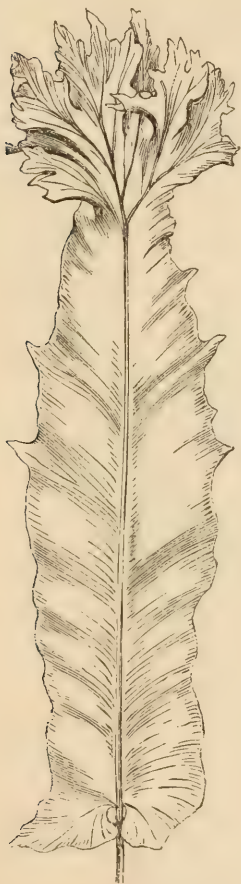


Fig. 616.

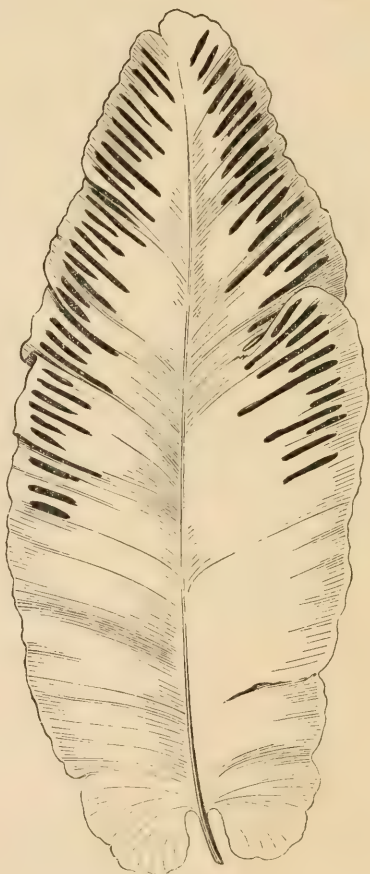


Fig. 617.

LATIFOLIUM, Lowe. (Fig. 617.)—Found near Totness by the Rev. C. Padley, of Beaconfield, near Plymouth. A large broad-fronded variety of an ovate-oblong form, irregularly undulate, and the apex blunt. Sori conspicuous, and very irregular in extent. My thanks are due to Mr. Padley for fronds.

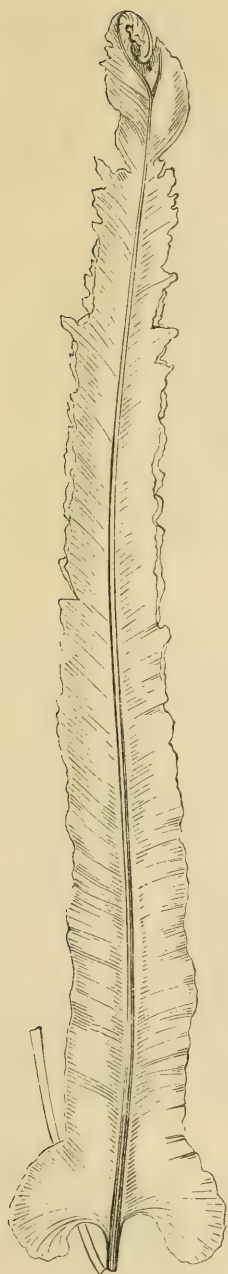


Fig. 618.



Fig. 619.

PERIERGON, *Lowe*. (Fig. 618.)—A singular variety found in Devonshire by Mr. Moly. It has two broad lobes at the base, and the lower half is somewhat undulate; the upper half is marginate and irregularly cut, without destroying its general outline. The midrib branches at the apex, and is tortuose. My thanks are due to the Rev. C. Padley, of Beaconfield, Plymouth, for fronds.

SCALPTURATUM, *Moore*. (Fig. 619.)—One of the *muricatum* section. Found in Guernsey by Mr. J. James, of Vauvert; at Nettlecombe, Somersetshire, by Mr. C. Elworthy; and in the Isle of Wight by Mr. R. Bloxam. Fronds twelve inches long, exclusive of the stipites, and an inch to an inch and a half broad. Profoundly crenato-lobate, the base cordate, and the apex attenuate. The upper surface irregularly ridgy towards the margin into confused conspicuous lines. The lobes sometimes entire and sometimes dentate. Often suprasoriferous and marginate. A handsome form.

SUPRALINEATUM, *Moore*. (Fig. 620.)—Found at Settle, in Yorkshire, by Mr. A. Clapham, of Scarborough; at Penryn, in Cornwall, by Mr. G. Dawson; at Ilfracombe by the Rev. J. M. Chanter; at Torquay and Dunchideock by Mr. R. J. Gray; at Nettlecombe, in Somersetshire, by Mr. C. Elworthy; at Petersfield, Hampshire, by Mr. G. B. Wollaston; in Sussex by the Rev. W. H. Hawker; in Surrey by Dr. Allchin; in the Isle of Wight by Mr. R. Bloxam; and in Guernsey by Mr. J. James and the late Mr. C. Jackson. One of the *marginatum* group, having an excurrent membrane developed from the surface of the frond. Length of frond from six to twelve inches, breadth from one to two inches. The base of the frond truncate or cordate, the apex obtuse, or acute, or sublobate, and the margins exterior to the membrane-like line, irregularly lobed or lacinate-dentate, occasionally undulate.

GYMNOSORUM, *Moore*. (Fig. 621.)—Found near Minehead, in Somersetshire, by Mr. W. Bowden, and is now in the possession of Mr. G. B. Wollaston, of Chiselhurst. A dwarf narrow form. Length of frond six inches. The base of the frond truncate, the apex multifidly lobed; somewhat repand on

the margin, with small uneven teeth, sometimes inciso-lobate, with the lobes pointing forwards. Stipites densely hair-scaly. Veins and sori very oblique, forming an acute angle with the costa. Sori small, crowded, and almost naked. The upper surface finely striate.



Fig. 620.

Fig. 621.

Fig. 622.

SINUATO-MULTIFIDUM, *Padley, MSS.* (Fig. 622.)—Found in North Devon, by the Rev. C. Padley, of Beaconfield, near

Plymouth. A fine form, with undulate fronds and a tortuose branching apex. My thanks are due to Mr. Padley for the illustration.



Fig. 623.

UNDULATO-RAMOSUM, *Lowe*. (Fig. 623.)—Found by Mr. Moly in Devonshire. A fine variety, of large size. The fronds undulate, with a large, much-branched, leafy, and undulate apex. I am indebted to the Rev. C. Padley, of Beaconfield, for fronds.



Fig. 624.



Fig. 625.

UNDULATO-CONTRACTUM, *Lowe*. (Figs. 624 and 625.)—Found in Devonshire by the late Mr. C. Jackson. An irregular form of the *marginatum* group, only partially and irregularly mar-

ginate. Undulate and irregular in its outline, sometimes contracted in the centre of the frond, and at others at the apex.



Fig. 626.



Fig. 627.

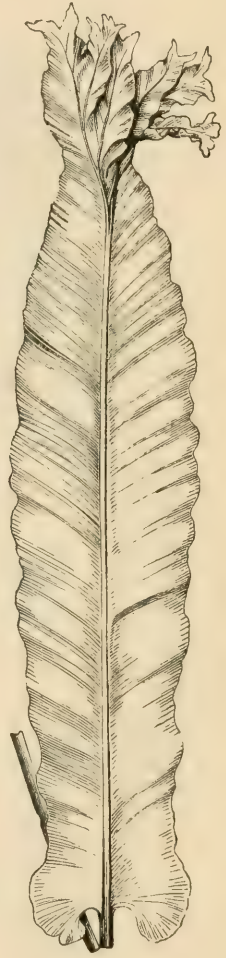


Fig. 628.

MURICATO-MARGINATUM, *Padley, MSS.* (Fig. 626.)—Found by Mrs. Thompson, of South Lawn, Exeter, near Netherton, Sir Edmund Prideaux's seat. A similar plant was found in

North Devon by the Rev. C. Padley, of Beaconfield, near Plymouth, in which the fronds run out at the apex to a very sharp point; and a third plant found near Ilfracombe by Mr. Dadds. It is a marginate and muricate form, the margin being finely fimbriated. The illustration is from Mrs. Thompson's frond.

UNDULATO-LOBATUM, *Moore*. (*Crispum-multifidum* of Gardens.) (Fig. 627.)—A form of *undulatum*, with the apex of the frond several times forked, the branches spreading, and forming a head of curly segments. Found at Littlehampton, in Sussex, by Mr. G. B. Wollaston, of Chiselhurst; in Guernsey by Mr. J. James, of Vauvert; Whitbarrow, Westmoreland, by Mr. G. B. Wollaston; and Littleham, in Devonshire, by the Rev. C. Padley, of Beaconfield. The varieties vary somewhat from the different localities. The illustration is from Mr. Padley's plant.

RAMUSCULUM, *Lowe*. (Fig. 628.)—Found in Devonshire by Mr. W. Edwards, of Nuthall, Nottinghamshire. Somewhat undulate, with a lobate base, and a small, thick, leafy, multifid apex. The illustration is from Mr. Edwards' frond.



Fig. 629.—(Edwardsii, page 246.)



Fig. 630.

PHYLLOLOPHYRON, *Lowe*. (Fig. 613, page 246.)—Found in Devonshire by Mr. Edwards, of Nuthall, Nottinghamshire. A

rather dwarf, handsome form. Branching at the base in the stipes, and branching and re-branching two or three times along the frond. A wide-spread very broad head. The illustration is from Mr. Edwards' fronds.

PROLIFERUM, *Wollaston*. (Fig. 630.)—A singular monstrosity, which was raised from spores by Mr. Wollaston, of Chiselhurst. It is of the *marginatum* group, dwarf, scarcely three inches in length, and usually the lamina only one inch long, and from three to five eighths of an inch wide, mostly oblong, sometimes cornute, profoundly and irregularly marginate; the excurrent membrane so very much developed, that the frond appears as if split in two edgewise on either side of the costa. The upper surface of the frond irregularly verrucose. It bears no sori, but on the surface of the frond are little bulbils, which ultimately form small plants resembling the parent. Occasionally the fronds are wholly stipes and costa, without any leafy portion, and these taper and are pointed like an awl. My thanks are due to Mr. Elworthy, of Nettlecombe, for a plant.



Fig. 631.



Fig. 632.

SPIRALE, *Moore*. (Fig. 631.)—One of the *crispum* series, found in Guernsey by Mr. J. James, of Vauvert; and at Nailsworth, Gloucestershire, by Mrs. Campbell. A singular distinct form. Length of frond three to five inches, and about an inch wide. The basal part undulate, becoming twisted towards the apex in the manner of a corkscrew. My thanks are due to Mr. P. Neill Fraser, of Cannon Mills Lodge, Edinburgh, for a plant.



ELWORTHII, Moore. (Fig. 632.)—Raised from spores by Mr. C. Elworthy, of Nettlecombe. A singular, dwarf, ramose-flabellate variety. Length of frond two inches, exclusive of the stipites, and three inches wide. The fronds consist of three branches, one of which is three times divided, the branches being flabellate, deeply cut, with undulating imbricated lobes. Slightly marginate. The fronds form a dense mass of lobate, dentate, fan-shaped, wavy divisions. My thanks are due to Mr. Elworthy for a plant of this variety.

SUBMARGINATUM, Wollaston. (Plate LII—A.)—A not uncommon form, found in Ireland by Dr. Allchin; in Guernsey by the late Mr. C. Jackson and Mr. J. James; at Sunderland by Mr. J. Fairbridge; at Castle Howard, Yorkshire, by Mr. C. Monkman; at Settle by Mr. A. Clapham; at Doncaster by Mr. S. Appleby; at Malham by Mr. A. Stansfield; at Mowthorpe Dale, Coxwold, and Rivaux Abbey, Yorkshire, by Mr. C. Monkman; at Worksop, Nottinghamshire, by Mr. S. Appleby; at Ilfracombe by the Rev. J. M. Chanter; at Littlehampton by Mr. G. B. Wollaston; at Hastings by Mr. S. F. Gray; at Glanville's Wootton, Dorsetshire, by Mr. G. B. Wollaston; in the Isle of Wight by Mr. R. Bloxam; at Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; and at Southerndown, Glamorganshire, by Mr. T. H. Thomas. The fronds are only here and there furnished with the excurrent marginate membrane. Normal in size, from eighteen to twenty-four inches in length. Sometimes furcate or multifid, the margins crenate-lobate. Copiously soriferous beneath, and also suprasoriferous. The illustration is from Mr. C. Monkman, of Malton.

JUGOSUM, Moore. (Plate LII—B.)—One of the *muricatum* group. Found in Guernsey by Mr. J. James, of Vauvert; at Barnstaple by the late Mr. Jackson; and at Ottery St. Mary by Mr. G. W. Wollaston. Distinguished by the thickening of the veins which bear sori, and producing a series of herbaceous ridges or sorus-like excrescences on the upper surface, on the opposite side to the sori. Length of frond twelve to fourteen inches. The illustration was sent by Mr. C. Monkman, of Malton.

LENTONENSE, *Lowc.* (Fig. 633.)—Raised here from spores. Irregularly cut along the margin, with here and there extended lobes. Undulate. Near the apex flat and almost normal, and here alone fertile, the spore-cases being narrow.



Fig. 633.



Fig. 634.



Fig. 635.

MURICATUM, *Moore.* (Fig. 634.)—Found in Guernsey by Mr. J. James, of Vauvert; at Nettlescombe by Mr. C. Elworthy; and in the Isle of Wight by Mr. R. Bloxam. The fronds normal in size, coriaceous, base cordate, apex attenuate, the

margin somewhat crenately-lobed or sinuous, here and there partially crenate. The upper surface of the frond is striately furrowed, the tissue being depressed between the veins, producing parallel furrows. On the veins are abundant elevated points spread over the whole frond. My thanks are due to Mr. Elworthy for a plant.

AIKMOTON, *Lowe*. (Fig. 635.)—Raised from spores by the Rev. C. Padley, of Beaconfield, near Plymouth. A very distinct variety, combining many distinct characters. Marginate, forked or branched, and suprasoriferous. The margin of the frond distinctly divided to the *marginatum*-like belt, and these lobes crenate or dentate on their margin. The illustration is from Mr. Padley's fronds.



Fig. 636.

TORTUOSO-CRISTATUM, *Lowe*. (Fig. 636.)—A magnificent variety, raised here from spores of *digitatum*. Length of frond ten inches. Half a dozen fronds will form a bush twelve inches across. It is a much-branched variety, densely crested, and is singularly distinct, from being everywhere exceedingly twisted.



Fig. 637.



Fig. 638.

PTYOIDES, *Lowe*. (Fig. 637.)—Found in Devonshire by Mr. W. Edwards, of Nuthall, Nottinghamshire. Length eight inches. Base truncate. A frond of thick substance, here and there split to the midrib. From the centre of the frond the midrib branches, and each branch again branches. The upper half of the frond is much lacinated. Veins distinct and club-headed below the branching half of the frond, but on the branching portion indistinct. My thanks are due to Mr. Edwards for the plant from which the illustration is taken.

CRISPUM-GRANDIDENS, *Lowe*. (Fig. 638.)—A remarkable sport of *crispum*, found in North Wales by Mr. Clift, of Balsall Heath, Birmingham, and now in my possession. It resembles

crispum, except that it is also split quite to the midrib. The base is wide, and overlapping, with crisped lobes.



Fig. 639.



Fig. 640.

DIVERGENS, Moore. (Fig. 639.)—Found at Nettlecombe by Mr. C. Elworthy. A singular variety, with fronds three inches in height, excluding the stipites; their base being normal, near the apex the fronds divide into two wide-spread branches, the breadth at the top being five inches. The branches lobate or multifid-tipped. The lower margin is normal, but the upper one is contracted and dentate. Sparingly fertile on the normal portion of the lobes. I am indebted to Mr. Elworthy for a plant.

CLIFFII, Lowe. (Fig. 640.)—Found in North Wales by Mr.

Clift, of Balsall Heath, Birmingham, and now in my possession. One half the length of the frond is naked, the leafy portion coriaceous and narrow, with a smooth even margin. The frond terminating in a large compact multifid head, very leafy, and uncut on the margins. Length twelve inches. Sori sparingly distributed.



Fig. 641.

PATULUM, *Lowe*. (Fig. 641.)—A very large form of *ramosum* found at Littleham, Devonshire, by the Rev. C. Padley, of Beaconfield, near Plymouth. The rachis branches in the middle of the frond, and each of these branches divides repeatedly. Undulate. My thanks are due to the Rev. C. Padley for the frond illustrated.



Fig. 642.



Fig. 643.

FIMBRIATUM, *Allchin*. (Fig. 642.)—Found in Guernsey by Dr. Allchin. A distinct form of the *marginatum* section, with two kinds of fronds. The broader fronds are six to nine inches long, and three quarters of an inch wide; the base contracted and truncate, frequently with small separate lobes, the margins irregularly fimbriated, crenate-lobate, with the lobes undulated and crenate. Sori mostly exterior to the excurrent membrane. The narrower fronds are nine to twelve inches long, and only a quarter of an inch wide; so narrow is the leafy portion, that on either side it is only of the same width as the rachis itself: its margins are finely fimbriated. My thanks are due to Mr. P. Neill Fraser, of Cannon Mills Lodge, Edinburgh, for a plant.

VARIABLE, *Wollaston*. (Fig. 643.)—Found in Guernsey by

Dr. Allechin and the late Mr. C. Jackson; at Ilfracombe by the Rev. J. M. Chanter and Mr. J. Dadds; at Barnstaple by the late Mr. C. Jackson; at Nettlecombe, Somersetshire, by Mr. C. Elworthy; at Littlehampton, Sussex, by Mr. G. B. Wollaston; and near Preston by Mr. A. Stansfield. A coarse-growing variety, with variable fronds both in form and size. Sometimes more or less normal, with an unequal cordate base, below which is a reniform lobe or branch. Some fronds are normal, except being branched in the stipes, near the base, or near the apex. Sometimes abbreviated and abrupt. Sometimes abbreviated and terminating in two overlapping lobes. Sometimes the margin is very unequally divided, occasionally quite to the midrib, the divisions forming rounded lobes. The base is mostly unequal, and having a lobe of one or two inches in length formed there. In some the stipes is divided. Occasionally branched. The plants invariably have the distinct basal reniform branch either stalked or sessile. Copiously soriferous. The illustration is from Mr. C. Monkman, of Malton.



Fig. 644.

UNILATERALE-RAMOSUM, *Lowe*. (Fig. 644.)—Found by Mrs. Thompson, of South Lawn, Exeter, at Sidmouth. In the

variabile section. An excellent and very distinct variety. More or less undulate, and normal on one side the rachis whilst it is branching on the opposite side, and the branches are cristate. I am indebted to Mrs. Thompson for fronds.

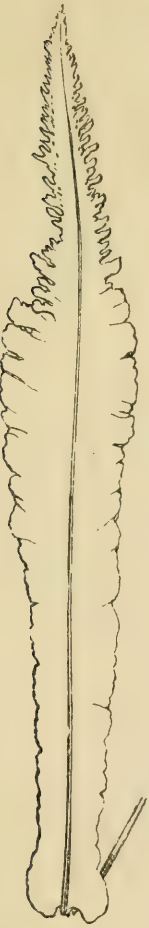


Fig. 645.



Fig. 646.

MARGINATO-CONTRACTUM, *Lowe*. (Fig. 645.)—A large-growing, somewhat undulate form, with an inconspicuous crenate margin. Length of frond eighteen inches, width one inch and a half at
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the base, widening to two inches and a half six inches below the apex, then suddenly contracting to three quarters of an inch, with a marginate and minutely-lobate edge. Raised from spores by Mr. Elworthy.

MULTIFIDUM, Gray. (Fig. 646.)—Found at Littlehampton by Mr. G. B. Wollaston; Nettlecombe by Mr. C. Elworthy; Frenchay, near Bristol, by Mr. T. H. Thomas; Coninbrough Cliffs by Mr. J. Hardy; in Cumberland by Mr. R. Morris; Ruthin by Mr. T. Pritchard; Colin Glen, Belfast, by Mr. A. Crawford; Kilmoganny, Kilkenny, and Black Head, Clare, by Mr. J. R. Kinahan. Normal below, and divided at the apex into several multifidly-cleft branches, spreading out into a broadish dense flattish tuft. It differs from *lobatum* in the primary apical divisions being dilated and split into several smaller segments.



Fig. 647.



Fig. 648.

DISTORTUM, Moore. (Fig. 647.)—Raised from spores by Mr. Elworthy. A singular distorted form. Stipites bent, frond

narrow and irregular in outline, branching several times near the apex, and becoming wider and more deeply cut.

DIGITATUM, *Wollaston*. (Fig. 648.)—Originally raised from spores by Mr. G. B. Wollaston, of Chiselhurst, and has since been found at South Weald, Brentwood, Essex, by Miss Lucy Moss. This variety differs from *ramosum* in all the branches and divisions being flat or in one plane, being hand-shaped. The stipites sometimes branched, and the lamina mostly branched, both near the base, and higher up the costa. The central part of the frond is much branched into a dense tuft of crowded segments, which are much overlapping. The ramifications are compound in an extraordinary degree. For plants my obligations are due to Mr. Edwards, of Nuthall, Nottinghamshire; Mr. Clapham, of Ramsdale Bank, Scarborough; Mr. Cooling, of Derby; and Mr. C. Monkman, of Malton. The fronds are usually much more branched than the illustration.

BIMARGINATUM, *Wollaston*. (Fig. 649.)—Found at Rotherham, in Yorkshire, by Mr. H. Hayling, gardener to the Rev. W. Hudson, of St. Catherine's, Regent's Park; also at Brecon, by Mr. J. R. Cobb; at Ulverstone, by Mr. Hadwin; Oldstead, Mr. C. Monkman; and raised from spores by Mr. C. Elworthy. Fronds varying, some from a quarter to half an inch wide, and six or eight inches long; others three quarters of an inch wide, and from six to nine inches long. Mr. Monkman's plant has fronds eighteen inches in length, and is more like *marginatum*, except in the more numerous minute denticulation on the margin. Base truncate, frequently broken up into a few separate lobes; apex usually simple, sometimes multifid. The margin laciniate-dentate, or cut into narrow, shallow, truncate lobes, which are bifid or dentate. The surface both above and below is marginate, hence the name *bimarginatum*. The under marginate line similar to that in *marginatum*, but this cuticle on the upper surface is irregularly broken into cavities and excrescences. The top of the frond broader and scarcely marginate. A very curious form. The illustration is from Mr. C. Elworthy's plant.

MARCHANTIOIDES, *Clapham*. (Fig. 650.)—Another of Mr. Clapham's singular varieties. Fronds twelve inches in length,

and from half an inch to two inches and a half in width. Stipites two inches and a half. At the base of the frond are two reniform lobes, one inch across, above which the frond is contracted to half an inch; nearly strap-shaped, except the upper half or third, where wide and normal, one half of the fronds dilated at the apex, and forked. The narrow portion of the frond marginate beneath, beyond which lobate and fimbriate on the margin, with numerous raised crispy excrescences, beyond which are here and there irregular flat lobes. Soriferous. Colour deep green. My thanks are due to Mr. Clapham, of Scarborough, for a plant.



Fig. 649.



Fig. 650.



Fig. 651.

TURGIDO-IRREGULARE, *Moore*. (Fig. 651).—Found at Whitby by Mr. W. Willison, and Nettlecombe by Mr. C. Elworthy.



SCOLOPENDRIUM VULGARE,



S. VULGARE,

Not unlike *turgidum*, more irregular in outline, and more profoundly and distinctly lobed, and submarginate. The illustration is from Mr. C. Elworthy.

SUBLINEATO-STRIATUM. (Plate LIII—A.)—A very interesting variety, much cut, and very irregular on the margin. The fronds are crenately lacerated on the edges, and margined with a line along the under surface of the frond. This Fern differs from the other submarginate varieties in having raised lines and striæ across the upper surface of the frond. Sori bold, near the margin, and with small detached portions almost marginal. Length about twelve inches, breadth from one to two inches. Veins darker, giving the frond a striped appearance. Apex of frond pointed. It was gathered in Devonshire by Mr. Hillman, a well-known collector of Ferns. For fronds my thanks are due to Messrs. Stansfield, Vale Gardens, Todmorden.

SAGITTATO-CRISTATUM, Clapham. (Plate LIII—B.)—A handsome variety, arrow-shaped at the base. The fronds are slightly undulated or wavy, and dichotomously divided, the apices multifid, broad, and somewhat cristate and striate. Basal lobes sagittate. Somewhat inconstant. Found in Raincliff Wood, near Scarborough, by Mr. A. Clapham, where it was found in some abundance. A much finer and quite constant form has since been found in Devonshire, in 1859, by Mr. Hillman. In this variety the lobes are truly sagittate, and sometimes cristate, and the fronds are terminated by a corymbose tassel, frequently nine inches across. Mr. Clapham's form is about twelve inches in length, and three inches in breadth at the apex. My thanks are due to Mr. Stansfield, of Todmorden, for fronds.

STENOMENON, Lowe. (Fig. 652.)—A narrow form in my possession. Length ten inches, width half an inch. Thick fronded, deep green in colour. An excurrent membrane runs near the rachis the whole length of the frond, terminating in a small divided leafy segment, this is distantly fimbriated with sporiferous segments. The frond is narrow and very regularly fimbriated, and here and there are soriferous projecting segments at the base of the fimbriated lobes. Fronds numerous and suberect.



Fig. 652.



Fig. 653.

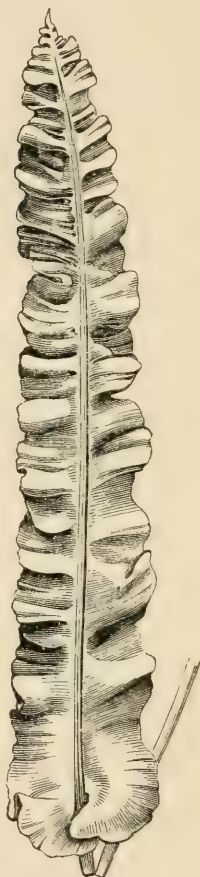


Fig. 654.

FISSUM-LATUM, *Moore*. (Fig. 653.)—Found near Nettlecombe by Mr. C. Elworthy. A large-growing form. Fronds two feet in length. Profoundly and irregularly cut on the margin, and slightly undulate, narrowing to the base, and acute pointed at the apex. Width at the base one inch, and in the centre of the frond two inches. Sori large, profuse, and irregular. My thanks are due to Mr. Elworthy for a plant, from which the illustration is taken.

UNDULATUM, *Moore*. (Fig. 654.)—Found at Torquay by Mr. R. J. Gray; Nettlecombe, by Mr. C. Elworthy; Fareham, Hampshire, and Ruthin, Denbighshire, by Mr. G. Pritchard; Oswaldkirk, Helmsley, Yorkshire, by Mr. A. Clapham; Whitby, by Mr. W. Willison; Colin Glen, Belfast, by Mr. A. Crawford; Chaigeley Manor, near Clitheroe, and Cromford, Derbyshire, by myself. Regularly wavy fronds, but much less crispy than in *crispum*. Fronds narrower, and in being fertile, it is unlike the sterile *crispum*. Length of frond twelve inches, width one inch and a half.



Fig. 655.



Fig. 656.



Fig. 657.



Fig. 658.

TURGIDUM, *Wollaston*. (Fig. 655.)—Found at Week, in Sussex, by Mr. G. B. Wollaston; Nettlecombe, Somersetshire, by Mr. C. Elworthy; Barnstaple, Devonshire, by the late Mr. C. Jackson; Ilfracombe by Mr. J. Dadds; Castle Howard and Oldstead, Yorkshire, by Mr. C. Monkman; Hackness, near Scarborough, and Knaresborough, by Mr. A. Clapham; Whitby by Mr. W. Willison; Todmorden by Mr. A. Stansfield; Whit-

barrow, Westmoreland, by Mr. F. Clowes; Guernsey by Mr. J. James; and at Morecombe Bay by myself. Named on account of the turgid character of the cellular tissue between the veins. Fronds coriaceous, from six to twelve inches in length, and from an inch and a half to two inches broad. The margin very irregularly lobate, or crenate-lobate, here and there split quite to the costa. Crenate-dentate or laciniate-dentate; more or less marginate, often close to the margin, and occasionally near the costa. Base cordate. The apex frequently forked or multifid, sometimes abrupt. Venation irregular. Fertile and permanent under cultivation. The illustration is from Mr. C. Elworthy.

ALATUM, Clapham. (Figs. 656 and 657.)—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. A dwarf narrow-fronded Fern, six inches in length, marginate and winged for the whole length of the frond, with projecting bidentate teeth, narrowing to the base. My thanks are due to Mr. A. Clapham for the illustration.

MARGINATO-LACERATUM, Clapham. (Fig. 658.)—Raised from spores by Mr. A. Clapham, of Scarborough. Variable fronds. Some dwarfer and more profoundly cleft; others variously split to the costa, the divisions forming distant, variously sized, irregular lobes. Some fronds oblong, with sinuous margins; some obtusely cuneate; some broader, variously cleft and multifid crisped, the parts being more or less marginate. The costa in some fronds is bare to near the apex, and the frond then becomes fan-shaped, having narrow, minute, dissimilar divisions. In others, when spread flat, forming about three parts of a circle of five inches in diameter, and consisting of five cuneate sections divided down nearly to the top of the stipes, and each section two or three times deeply cleft with lacerately-toothed margins.

FISSO-LOBATUM, Moore. (Fig. 659.)—Found near Nettlecombe by Mr. C. Elworthy. Length of frond twelve inches, width from half an inch to an inch. An interesting variety, somewhat resembling *fissum*, except in the multifid apex. Fronds lobate on the margin, and numerously split into narrowish laciniæ, the apex similarly dentate and multifidly lobed.

Contracted below the apex, irregularly reticulated, and copiously

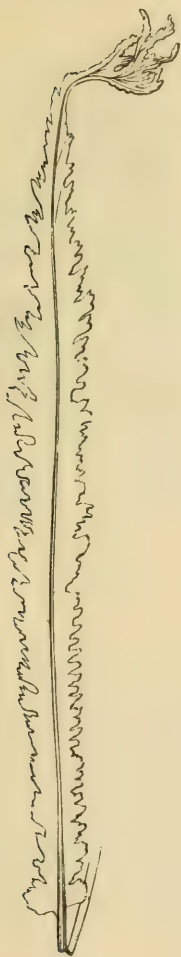


Fig. 659.



Fig. 660.

fertile, and also suprasoriferous. The illustration is from Mr. Elworthy.

TRANSVERSO-MULTIFIDUM, *Moore*. (Fig. 660.)—Found by Mr. Dadds near Ilfracombe. Fronds more or less undulate, with a multifid apex, which is weeping and compact. The illustration was forwarded by the Rev. C. Padley, of Beaconfield, near Plymouth.



Fig. 661.

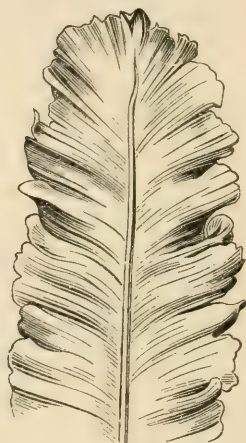


Fig. 662.

FLABELLATUM, *Moore*. (Fig. 661.)—Found near Nettlecombe by Mr. C. Elworthy, to whom I am indebted for a plant. A handsome form, with flabellately multifid fronds, six to eight inches in length, and as much across in the multifid portion. The fronds in the portion lower are normal, but in the upper half the costa becomes repeatedly branched, the branches continuing broad almost to the tips, the divisions much overlapping, yet scarcely cristate. The multifid apex is spread out nearly flat.

CORNUTUM, *Moore*. (Fig. 662.)—Found in Yorkshire by Mr. Thorne, and subsequently in the same county by Messrs. Stansfield, in Somersetshire by Mr. C. Elworthy, and Dunglass Dean, Dumbartonshire, by Dr. W. Nichol. Fronds from six to ten inches long, coriaceous, slightly undulate, and irregularly crenate, occasionally profoundly lobed, the lobes minutely

dentate, base cordate or truncate, the apex abruptly rounded, the costa becoming excurrent half an inch below the extremity, and forming a long hook. Fertile.



Fig. 663.



Fig. 664.

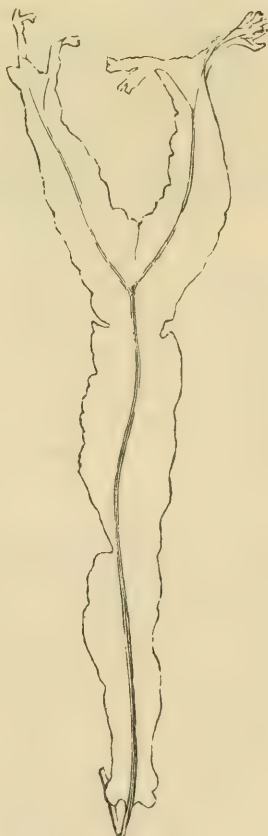


Fig. 665.

BALFOURII, Lowe. (Fig. 663.)—A thick, fleshy, upright-growing variety, irregular in form, and divided into numerous lobes. An excurrent membrane runs from the base to the apex, which is fimbriate, and irregular on either side the rachis, in places being situated on the edge of the rachis, in

others extending to the margin of the frond, and then forming a double row of lobes, which are soriferous along their edges. Cornute. Length ten inches. Found in Westmoreland, near Ambleside.

MUTATUM, *Moore*. (Fig. 664.)—Found near Nettlecombe by Mr. C. Elworthy. A narrow form, eighteen inches in length and half an inch wide, with occasionally a normal or portions of a normal frond. Incised half way to the costa at regular distances about half an inch apart, forming truncate square-tipped lobes. Sori irregular, and extended downwards from the base of the two sides of these divisions quite to the costa. The illustration is from Mr. Elworthy's plant.

PLUMOSO-LOBATUM, *Moore*. (Fig. 665.)—Found at Nettlecombe by Mr. C. Elworthy. A form of *lobatum*, in which the fronds are narrowed below and forked towards the apex, the branches again once or twice forked, so that the apex consists of a few attenuated lobes three or four inches long, which curving more or less give the appearance of a plume of feathers.

SUPRALINEATO-RESECTUM, *Moore*.—Found in Guernsey by Mr. James. Fronds lanceolate, tapering to the base, apex attenuate. Length six to eight inches, width one inch to one inch and a half in the broadest part. Margin crenately dentate. Supralineate and fertile. *Marginatum* series.

SUPRALINEATO-LOBATUM, *Moore*.—Found at Nettlecombe by Mr. Elworthy, and in the Isle of Wight by Mr. R. Bloxam. Length eight inches. Base subcordate, slightly supralineate, margin crenate-lobate, apex lobate or multifid. *Marginatum* section.

SINUATO-LOBATUM, *Moore*.—Found in Somerset by Mr. Elworthy. Fronds broad, lobed or sinuated, and irregular in width and outline. Apex twice dichotomously forked; with broad, somewhat crispy divisions. Base cordate. *Polyschides* section.

VESPIFORME, *Clapham*.—Found at Fountains Abbey, Yorkshire, by Mr. A. Clapham, of Scarborough. Singular. Base cordate, apex attenuate, and regular and entire on the margin, except about the centre, where a portion becomes contracted almost to the costa. *Polyschides* section.



Fig. 666



Fig. 667.

ROTUNDIFOLIUM, *Lowe*. (Fig. 666.)—In the possession of Mr. C. Monkman, of Malton. Dwarf; fronds two inches in length, including the stipes. Reniform, and closely resembling the fronds of *Adiantum reniforme*. Fronds sterile.

MULTIFIDUM-NANUM, *Lowe*. (Fig. 667.)—An interesting dwarf form, found in Devonshire by Mr. W. Edwards, of Nut-hall, Nottinghamshire. Twin-fronded, one half the length of the frond is naked, the remainder being a corymbiferous head, undulate, and finely and distinctly cut along the apex. The frond for illustration was forwarded by Mr. Edwards.

MARGINATO-FIMBRIATUM, *Moore*.—Found near Cartmel, Lancashire, by Mr. Hillman, and in Silverdale, Yorkshire, by Messrs. Stansfield. Narrow, base subcordate, margin fringed with small prominent regular teeth.

MARGINATO-FISSUM, *Moore*. Found at Barnstaple by Mr. C.

Jackson, and at Ilfracombe by Mr. J. Dadds. Base broadly-cordate, apex acute, margin deeply cut into narrow obtuse lobes.

MARGINATO-LOBATUM, *Moore*.—Raised from spores by Mr. Elworthy and Mr. Wollaston. Length ten to fourteen inches, width an inch. Margin laciniate-dentate, apex multifidly-lobed, dentate, and with acute apices.

MARGINATO-CRISTATUM, *Moore*.—Raised by Mr. Clapham, of Scarborough, and Mr. Elworthy. Length six to nine inches, lower portion marginate, the apex dividing into a crispy flabellate tuft of laciniate segments, three to four inches broad.

MARGINATUM-TENUE, *Moore*.—Raised by Mr. S. Appleby, of Doncaster, and Mr. W. Nixon. Length three to six inches, width a quarter to half an inch. Marginate and laciniate-toothed, sometimes irregularly toothed. Some fronds cornute or dilated, occasionally proliferous.

CURIOSUM, *Wollaston*.—Found near Worthing by Mr. W. W. Reeves. A portion of the fronds resemble *sinuatum*. Sometimes the lamina is narrowed, but entire for a considerable portion, base usually much narrowed and then truncate, with reticulated veins. Upper surface distantly streaked with yellowish green. *Polyschides* section.

SALEBROSUM, *Moore*.—Found in Guernsey by Mr. James. Allied to *sinuatum* with shorter fronds. Base subtruncate or cordate. Apex attenuate, margin not contracted, but beyond the general outline projecting lobes, the whole (lobes included) crenately toothed. *Polyschides* section.

OBTUSILOBATUM, *Moore*.—Found in Somerset by Mr. Elworthy. A large form of *salebrosum*. *Polyschides* section.

RETINERVIUM, *Moore*.—Found in Ireland in 1853, by Dr. Allchin. Fronds nine inches long; they are dissimilar, even in outline, apex sometimes multifid, margin lobed, and here and

there contracted and marginate. Fronds blotched with pale green. Remarkable for the much-netted veins. *Polyschides* group.

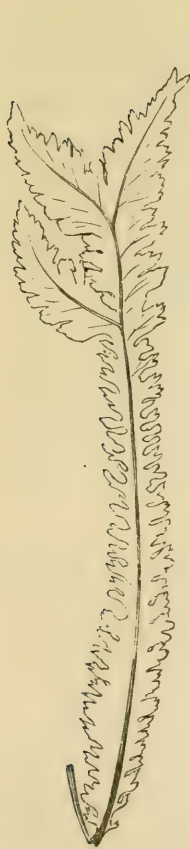


Fig. 668.



Fig. 669.



Fig. 670.

MARGINATO-TRIFORME, *Padley MSS.* (Fig. 668.)—Found in Devonshire by the Rev. C. Padley. Marginate near the costa to within three inches of the apex, where this line terminates. Fronds fourteen inches long, contracting in the centre of the frond from an inch to half an inch, and dilating near the apex to one inch and a half. Margin irregularly lobed and dentate. In the centre of the frond lobes more distant, with wide open

sinuses. The apex more normal, with a crenate margin, and a multifid or furcate apex. Sori situated along the marginal line in small patches, whilst near the apex more or less normal. My thanks are due to the Rev. C. Padley for fronds.

CONVOLVERE, *Lowe*. (Fig. 669.)—In the possession of the Rev. Charles Padley, of Beaconfield, near Plymouth. In the *crispum* section. A distinct frilled form. Length fourteen inches, width three inches in the widest part. Stipes ebeneous. Near the base a crisp and incised lobe an inch in width, above which the stem is naked for two inches, above which three inches wide, very much frilled, decurrent at the base. In several parts cut to the costa, leaving wide spaces. Midrib flexuose. My thanks are due to the Rev. C. Padley for fronds.

MULTIFIDO-LACERATUM, *Lowe*. (Fig. 670.)—Raised from spores at Highfield House. Sagittate at the base. The lower half variously lacerated, the upper portion merely undulate, and the apex inconspicuously multifid and crested. Sori profuse. Length of frond nine inches.

RESECTUM, *Moore*.—Found at Littlehampton, Sussex, by Mr. G. B. Wollaston. Normal size. Remarkable for the absence of the basal auriculate lobes. Base truncate, outline lance-shaped, margin slightly undulate and sinuately lobed, lobes crenately-dentate. *Polyschides* section.

MARGINATO-CAPITATUM, *Lowe*.—Found at Oldstead, Yorkshire, by Mr. John Muckle. Length of frond twelve inches, exclusive of the stipites; width from two to two inches and a half. Base lobate. Fronds wavy, marginate, above which narrowly and numerous denticulate. The apex flat but multifid, and no wider where multifid than in other parts of the frond. Abundantly soriferous. My thanks are due to Mr. C. Monkman, of Malton, for fronds. An illustration is needless.

MONKMANII, *Moore*.—Found at Castle Howard by Mr. C. Monkman. Fronds eight inches in length and two inches wide. Sagittate at the base, broadest upwards. Along the margin are

a few distant projecting-pointed lobes. The apex acute or occasionally divided.

SUBMARGINATO-MONKMANII, *Lowe*.—A narrow form of *submarginatum* found at Oldstead by Mr. C. Monkman, of Malton. Very elegantly and profusely denticulated on the margin. Sori more especially confined to near the edges of the frond, and much shorter than usual.



Fig. 671.



Fig. 672.

ARIETINUM, *Lowe*. (Fig. 671.—Recently found on Mount Edgecombe, on the border of Cornwall, by Mr. William Edwards, of Nuthall. Fronds fifteen inches in length, and one inch wide. A very angustate form of *undulatum*, with a multifid apex, below which the frond contracts to a quarter of an inch in width. The branches are small and curved downwards, not unlike a ram's head, hence the name. The illustration is from Mr. Edwards.

GLAVEI, *Lowe*. (Fig. 672.)—A singular form, raised by Mr. Glave, of Scarborough. Length of frond six inches, of which the lower four inches is the naked stipes, repeatedly branching into a number of almost leafless narrow divisions, which are lacinated, and dentate on the margins of the apices. My thanks are due to Mr. Glave for a frond.

HEMIONITOIDES, *Moore*.—Found near Nettlecombe, in Somersetshire, by Mr. C. Elworthy. Dwarf, subhastate, and coriaceous. The base enlarged and cordate, and the sides curving to the point. Lobes diverging and blunt-pointed. Length of frond five inches. An illustration is unnecessary.

RETICULATO-FISSUM, *Moore*.—Found at St. Lawrence, Isle of Wight, by Mr. R. Bloxam. Differing from *fissum* (which it resembles in general aspect) in the confluent, irregularly reticulated veins. *Polyschides* section.

VIVIPARUM, *Wollaston*.—Found in County Clare in 1853, by Dr. Allchin. Fronds only one to four inches in length, and from half an inch to an inch and a half wide. Irregular, margin very lacinate, and producing bulbillæ on the fronds and stipites. Sometimes undulate and sinuate lobate. *Polyschides* group.

OPACUM, *Moore*.—Found in Guernsey by Mr. James. Curious and depauperate, remarkable for its thick, opaque, dull-looking fronds. Length three to six inches. Narrow but variable in width, cordate and unequal at the base, and attenuate at the apex. Margin irregular and crenate, *Polyschides* group.

PROMINENS, *Moore*.—Found near Ruthin, Denbighshire, by Mr. T. Pritchard. Length twelve inches. Narrow, truncate below, attenuate to a blunt point, margin irregularly crenate, with a few irregular, rounded, narrow lobes, projecting half an inch beyond the general margin. *Polyschides* section.

INÆQUALE, *Allchin*.—Found in 1853 in Ireland by Dr. Allchin. Length six inches, width one inch. Costa ramose below, or multifid near the apex. Sometimes a lobe protrudes from the margin. Base truncate, margin deeply fimbriated or undulated. Sori irregular. *Polyschides* section.

EPIPHYLLOIDES, *Moore*. Found near Whitby by Mr. W. Willison. Fronds nine inches long, base subcordate, margin

irregularly lobate for two or three inches, then suddenly contracted almost to the costa, and then swelling out again, and truncately contracted at the upper end in the same way, tapering downwards. *Polyschides* section.



Fig. 673.



Fig. 674.

CORIACEO-CRISTATUM, *Lowe*. (Fig. 673.)—Raised from spores by Mr. A. Clapham, of Scarborough. Length of frond nine inches, including the stipes. Dark green in colour. Thick and fleshy in texture. Somewhat narrow and irregularly crenate on the margin, contracting towards the apex, where the stipes dilates and branches, forming a small thick crest. The illustration is from Mr. Clapham.

BIMARGINATO-MULTIFIDUM, *Moore*. (Fig. 674.)—An extraordinary bimarginate variety, twelve inches in length. Exceed-

ingly narrow, and broken up to the rachis, scarcely anything but the naked stem remaining, with a much-divided, large, multifid apex of narrow branches, soriferous along the margin. My thanks are due to Mr. Elworthy for a plant.

FURCANS, *Moore*.—Found in Somerset by Mr. Elworthy. Dwarf. Base cordate, apex once or more forked, sometimes divided into a tuft of five or six lobes. Margin unequally crenate lobate. *Polyschides* section.

CURTUM, *Moore*.—Fronds thick, variable, apex dentate, sometimes contracted, and base truncate; margin lobate, apex abrupt, ramose, or abbreviated. Here and there subcontracted and supralineate. Found in Somerset by Mr. Elworthy. *Polyschides* section.

INOPS, *Moore*.—Found in Guernsey by Mr. James, of Vauvert. Length six or eight inches. Narrowish, base cordate, irregular, margin crenate-dentate, apex forked, or also forked below. *Polyschides* section.

SUBVARIEGATUM, *Wollaston*.—Found at Glanville's Wootton, Dorset, by Mr. G. B. Wollaston. Fronds six to twelve inches long, exceedingly varied in form and multifid, undulate, crenate, and faintly streaked with a dull straw-colour. *Polyschides* section.

RIMOSUM, *Moore*.—Found in Guernsey by Mr. James, and raised from spores by Mr. Wollaston. Fronds eighteen inches long, and nearly two inches broad. Base cordate, margin subundulate, sublobate, and crenate; near the divided apex deeply incised. Upper surface sulcate, with here and there a thickened prominent point. *Polyschides* section.

IMPERFECTUM, *Wollaston*.—Found in 1855 by Mr. G. B. Wollaston. Lobed as in *polyschides*, but broader. Length ten inches, breadth one inch and three quarters. Base truncate, apex abrupt. Margin irregularly wavy, and here and there lobed. The margin has an unfinished appearance. *Polyschides* section.



STANSFIELDII, *Stansfield*. (Plate LIV—A.)—This magnificent, and, as yet, very rare variety, was raised from spores in the fernery of Messrs. Stansfield, of Todmorden, in the year 1859. It is quite constant, and when the fronds are in perfection it is the most beautiful of all the varieties of this protean species. The fronds are densely undulated, in the manner of



Fig. 675.



Fig. 676.

Scolopendrium vulgare, var. *crispum*; the undulations, however, in the variety *Stansfieldii* are lobed and profoundly lacinated, the projections being long-pointed and variously crisped and twisted, giving the whole frond the singular appearance of a *fringed frill*, if it is allowable to use this pleonastic phrase. The stipes is from two to three inches in length, and the fully-grown fronds twelve inches or more long, and about two inches broad. My thanks are due to Messrs. Stansfield, of the Vale Gardens, Todmorden, for the frond illustrated.

MARGINATO-IRREGULARE, *Moore*. (Plate LIV—B, and

Fig. 675.)—An interesting and desirable variety raised by Mr. Clapham, of Scarborough, a gentleman well known for the many remarkable varieties he has added to our British Ferns. Found also at Oldstead, Yorkshire, by Mr. C. Monkman. A very singular depauperated form. Sinuately lobed or irregularly contracted or laciniated. Length eighteen inches. Four or five inches below the apex branching, and each branch an inch below the apex again branched. Sometimes nearly the whole of the frond is depauperate, at others one side only of the costa; but everywhere very irregular. A remarkable form. My thanks are due to Mr. Clapham for a frond.

SUPRALINEATO-MULTIFIDUM, *Moore*. (Fig. 676.)—Length six inches, width one inch. Margin irregularly cut, supralineate near the costa, the apex multifid, their apices narrowed. The illustration is from Mr. Monkman.

CORIACEUM, *James*.—Found in Guernsey by Mr. James. Dwarf, coriaceous, irregularly inciso-dentate, submarginate, margin dentate. Base cordate, apex abrupt, irregularly soriferous.

NUDICAULE, *Allchin*.—Found in Ireland by Dr. Allchin. Variable, narrow, base cordate, apex sometimes multifid. An almost total absence of scales.

OBTUSO-DENTATUM, *Moore*.—Found in 1855 near Ilfracombe by the Rev. J. M. Chanter. Length six to twelve inches, width one inch and a quarter. Base truncate, apex blunt, the midrib not reaching the end, margin notched with uniform crenatures, sori irregular. Somewhat similar forms have been found in the Isle of Wight by Mr. R. Bloxam, and Wharfe, near Settle, by Mr. Clapham. *Polyschides* section.

INTERRUPTUM, *Wollaston*.—Found in County Dublin by the late Dr. Kinahan. Somewhat resembling the lacinate forms of *sinuatum*, only narrower and more fleshy. Remarkable for the interrupted lamina. Fronds twelve inches long and half an inch broad. Base subtruncate, apex normal; where narrow, sublobate, and dentate. There are interrupted portions of half an inch to one inch in which the costa is bared. *Polyschides* section.

BULLATUM, Moore.—Found at Littlehampton by Mr. G. B. Wollaston. Fronds six inches long and one inch broad. Base truncate, and somewhat supralineate, margin irregular and lobate, apex attenuated or forked. Sparingly fertile beneath and bullate or blistered above, the tissue being confused and opaque. Veins irregular. *Polyschides* section.



Fig. 677.



Fig. 678.

WARDII, Clapham. (Fig. 677.)—A distinct dwarf Fern, having a long stipites, and a small, massive, multifid head, with a round outline; very leafy, but very irregular in form, much cut, sometimes flat, and sometimes crisped on the margin. The upper surface of the frond copiously viviparous. Numerous fronded, forming a dense, circular, bush-like head. Length of frond six inches. Raised from spores by Mr. Glave, of Scarborough. My thanks are due to Mr. Clapham, of Scarborough, for a plant.

DENTATUM, Clapham. (Fig. 678.)—Length of frond six or eight inches. One half of the fronds more or less normal,

except a blunt apex, and the other half being most conspicuously dentate on the margin, with a blunt apex. My thanks are due to Mr. Clapham, of Scarborough, for fronds.



Fig. 679. *



Fig. 680.

PSEUDO-WARDII, *Lowe*. (Fig. 679.)—Raised by Mr. Glave and Mr. Clapham, of Scarborough, from bulbils of *Wardii*. A most dissimilar form, dwarf, four inches in length, the stipes one inch, above which dividing into three more or less normal-looking (scarcely undulate) fronds, which are forked or multifid at the apex. I am indebted to Mr. Glave for a plant.

JAMESII, *Lowe*. (Fig. 680.)—A singular Fern, raised from spores by Mr. James, of Vauvert. A very coriaceous frond, much divided at the apex like stag's horns, the sori formed within a very narrow margin, and appearing on the upper surface like a row of beads. Slightly crisped. Base of the frond sagittate, and one lobe bifid. Apex of frond variable. The illustration is from Mr. James, of Vauvert.

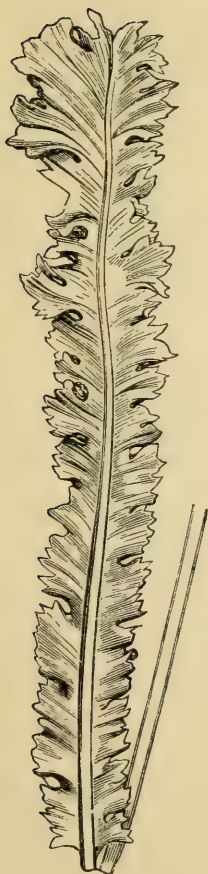


Fig. 681.

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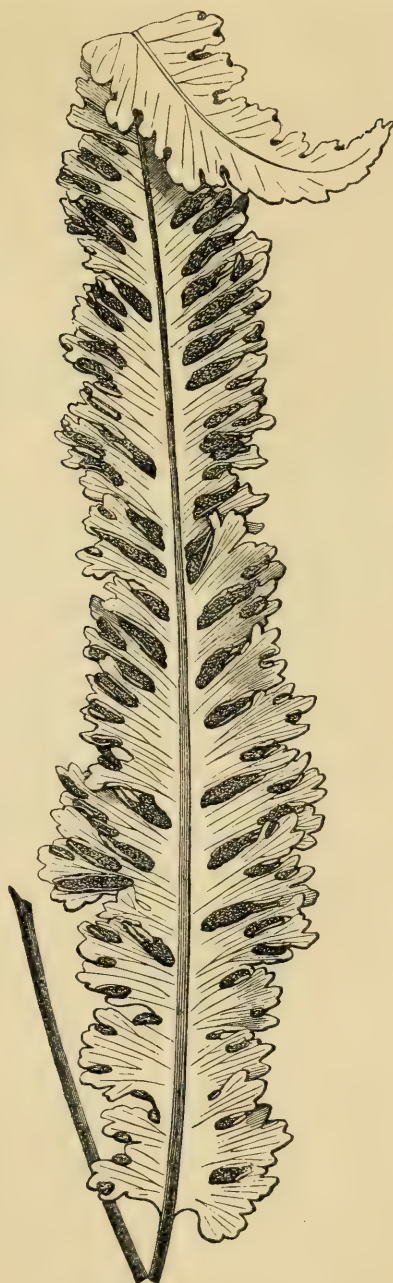


Fig. 682.

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FISSILE, Moore. (Fig. 681.)—Found near Nettlecombe by Mr. C. Elworthy, and at Mowthorpe Dale, Malton, Yorkshire, by Mr. C. Monkman. Fronds twelve inches in length, and one inch in width. Unequal and subtruncate at the base, narrowed at the apex. The margin profoundly lobed, or irregularly sub-pinnatifid. The large lobes unequal, separated by open sinuses, and again divided into rounded smaller lobes, or crenate-dentate. Sori exceedingly irregular and numerous. I am indebted to Mr. Monkman, of Malton, for fronds.

FISSILE-MONKMANII. (Fig. 682.)—An irregular form of *fissile*, found by Mr. Monkman at Oldstead, in 1859. Crenate-cripsed. Length fourteen inches. Sparingly soriferous, and slightly suprasoriferous.

MACROSORUM, Fee.—Found in the Channel Islands by Mr. James, of Vauvert. Twelve inches in length, and an inch broad, the margin frilled and irregularly lobed. Lobes deeply separated, but less manifest from not having open sinuses. Not unlike *polyschides*.

ANGUSTATO-NITIDUM, Lowe.—Raised from spores by Mr. A. Clapham, of Scarborough. Not unlike *polyschides* in general appearance, but the fronds longer and more erect, rich dark green in colour and shining. The plant has a less number of fronds than is usual with *polyschides*. A distinct form. An illustration is unnecessary.

LANCEOLUM, Moore.—Found in Guernsey by Mr. James, of Vauvert. Dwarf, lance-shaped. Base narrowed and cordate, apex attenuate, margin coarsely crenate and wavy. *Polyschides* section.

SICIFORME, Wollaston.—Found in Guernsey by the late Mr. C. Jackson. Length eleven inches, width one inch. Base sub-cordate, lance-shaped, with laterally-waved, slightly-crenate margins, obsoletely margined beneath. Soriferous, and also with small spore-cases on the upper surface.

CIRCINATUM, Lowe. (Figs. 683 and 684.)—Raised from spores by Mr. A. Clapham, of Scarborough. A narrow form, with fronds

fifteen to eighteen inches in length. Marginate, with a row of conspicuous bidentate marginal teeth. The apex tasseled, and the tassel curls round several times, that is, is circinate. The illustration is from Mr. Clapham.



Fig. 683



Fig. 684.—Apex.



Fig. 685.

POLYSCHIDES-CRISPUM, *Lowe*. (Fig. 685.)—Raised from spores of the variety *imperfectum* by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Length of frond ten inches. Closely resembling *polyschides*, except that it is beautifully crisped. My thanks are due to Mr. Clapham for fronds.

BIMARGINATO-MURICATUM, *Moore*.—Found in Guernsey by Mr. James, of Vauvert. Fronds twelve inches, two kinds, the

narrow fronds more bimarginate, outline irregular, contracted with projecting lobes, excurrent membrane situated near the costa, and interrupted. Broader fronds, margin unequally lobed and irregular, the surface striately furrowed.



Fig. 686.



Fig. 687.

RAMOSUM, *Willdenow*, (*Dædaleum* of Deakin.) (Fig. 686).—A variety known since the time of Plukenet, and very beautiful. More recently found at Ilfracombe and in Guernsey. Fronds brief, dense, and consisting of a multiplication of furcations, the stipites, which start singly from the caudex, becoming ramified like the limbs of a tree, the costa often again branched below, and each branch bearing a dense multifid-crisped tuft. In some instances the apex of the frond is ramified two hundred-fold. The illustration is from Mr. C. Monkman.

IRREGULARE-MINUS, *Clapham*. (Fig. 687).—Another singular form raised by Mr. A. Clapham, of Scarborough. Fronds only three inches in length, many branching at the base into twin fronds, and the costa dividing again near the apex. The margin of the frond very irregular, and somewhat crisped. The illustration is from Mr. Clapham's frond.

KITSONIÆ, *Moore*.—Found in Devonshire by Miss Fanny Kitson. Curious. Fronds twelve inches long, and one inch and a quarter broad. Base cordate, outline normal, upper surface muricate, and having an excurrent wing on either side, and closely contiguous to the costa.



Fig. 688.



Fig. 689.

BREVIFOLIUM, *Lowe*. (Fig. 688.)—Raised by Mr. Edwards, of Nuthall. Dwarf. Length of frond three inches, of which two inches is the stipites, and only one inch the leafy portion. Fronds variable in form, some divided to the stem, and lobate, crisped and irregularly cut on the margin, terminating in a blunt apex. The costa cornute. The illustration is from Mr. Edwards.

HENDERSONII, *Willison*. (Fig. 689.)—Found in 1866 near Whitby by James Henderson, who is employed in Mr. Willison's Nursery at Whitby. A dwarf form, only five or six inches in height. The stipites branching at the base, and again each branching some inch or so above the base, and these branches almost immediately dividing into dwarf fronds, normal at the base, and branching and dividing at the apex into beautifully crested heads, resembling five or six multifid fronds. My thanks are due to Mr. Willison for a frond of this unique Fern.

CRISPUM-MAJUS, *Jackson*.—Found in Guernsey by the late Mr. Jackson. Habit erect. Stipites stiff, and six or eight inches long, costa very thick, leafy portion twelve inches, colour deep green. Base cordate, with very large lobes forming the broadest part of the frond, being three inches across, gradually tapering to the apex. Margin frilled.



Fig. 690.

GLOMERATUM, *Moore*. (Fig. 690.)—Found in Jersey by M. Piquet, and introduced by the late Mr. C. Jackson. A very fine and beautiful form. Length from three to six inches, and destitute of any normal strap-shaped portion. The costa dividing so repeatedly and densely as to form a globular crispy mass, having the margins obtusely and obscurely crenate-lobate.

CONGLOMERATUM, *Lowe*. (Fig. 691.)—A form of *glomeratum*, found at Truro by Mr. Dadds, sufficiently distinct to bear a

name of its own. It differs in being less leafy, that is, more lacerated at the apices and more or less depauperate below the apex. It is known as the Truro form of *glomeratum*. My thanks are due to Mr. Elworthy for fronds.



Fig 691.

MARGINATO-MULTIFIDUM, Moore.—Raised from spores by Mr. Elworthy, of Nettlecombe. Length twelve inches. Narrow, with a somewhat flexuose marginate exerescence, and a multifid apex. Margin incised. Frond very narrow at the base, and widening gradually to the apex. Sori confluent, forming a sub-marginal interrupted belt. Soriferous even to the tips of the multifid lobes. The illustration is from Mr. Elworthy.

SCABRUM, Wollaston.—Found in Ireland in 1853, by Dr. Allchin. A handsome form, intermediate between *marginatum* and *muricatum*. Fronds twenty-six inches long, and two inches

broad. Base cordate and sublaciniate, apex attenuate, margin irregularly crenate-lobate, and slightly undulate. Submarginate beneath, and submuricate near the margin above. Upper surface uneven from cavities and raised lines and points, abundantly fertile, and slightly suprasoriferous.



Fig. 692.



Fig. 693.

DAREOIDES, *Wollaston*. (Fig. 692.)—Raised from spores by Mr. Elworthy, of Nettlecombe. Length twelve inches. So much cut as to become pinnatifid; base attenuated, widening to the apex, where rounded and broadest. Fronds varying in form.

HOOKEII, *Lowe*. (Fig. 693.)—Raised from spores at Highfield House. Triangular fronds, as broad across the base as the frond is long, namely, six inches. Very leafy, lacerated here and there, much divided along the margin, the frond undulate, terminating in a round tasseled apex.

SAGITTATO-POLYCUSPIS, *Moore*. (Fig. 694.)—A distinct form, twelve or fourteen inches in length, with usually long sagittate

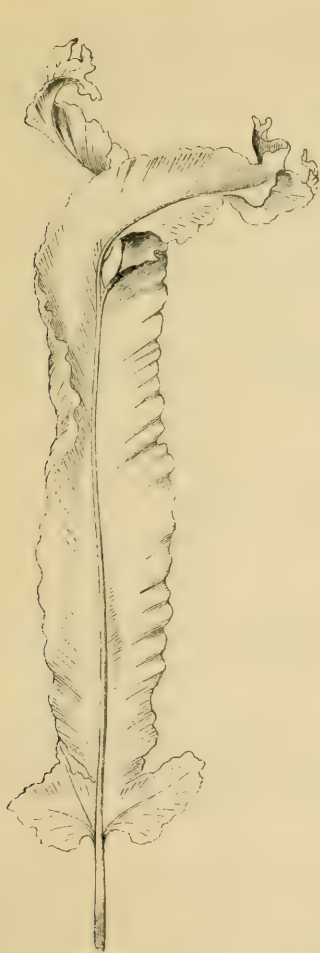


Fig. 694.



Fig. 695.

lobes at the base, and a large tufted apex four or five inches across, with pointed apices and very leafy. The illustration is not characteristic either as regards the base or apex of the best developed fronds. My thanks are due to Mr. C. Elworthy for a plant.

VARIEGATO-CRENATUM, *Wollaston*. (Fig. 695.)—A very fine variegated form of *crenatum*. Length seven inches. The apex furcate. My thanks are due to Mr. G. B. Wollaston for a frond.

CRISPUM-CORNUTUM, *Willison*.—Found by Mr. Joseph Buckle, of York. Broadest at the base, where lobate, apex pointed, crisped and incised along the margin, and cornute in the centre of the frond.

RAMOSUM-DENSUM, *Sim*.—Length from three to four inches. Twin-stalked, each stalk bearing simple or twin fronds half an inch wide and one inch long, and these branching, the branches two or three-forked and twisted out of the plane of the frond. The forkings broad-lobed, the lobes crenate, the whole forming a compact, very crispy crest. Distinct. Raised from spores by Mr. Sim, of Foot's Cray.

RAMOSO-RUGOSUM, *Sim*.—Length from one to three inches. Twin-stalked, and two or three times branched, each ultimate branch kidney-shaped and crumpled, irregularly deeply cleft, and these irregularly marginate-dentate. Scaleless. Short awl-shaped spurs are irregularly produced on the stalks, those on the midrib not awl-pointed but are a pygmy tassel of clustering points. Raised from spores by Mr. Sim, of Foot's Cray.

RAMOSUM-LATUM, *Sim*.—Length from nine to fifteen inches. Varying from *ramosum* in the much greater breadth of the terminal crest, which is very leafy and spreading.

SCALPTURATO-MARGINATUM, *Sim*.—Length from ten to fifteen inches, width one inch. The under surface resembling *marginatum*, on the upper surface, more especially in the lower half, resembling *scalpturatum*. Raised from spores by Mr. James, of Vauvert, Guernsey.

SUBMARGINATUM-TENUE, *Sim*.—Length from three to six inches, width from a quarter to half an inch, nearly erect, tapering, cleft into narrowish, shallow, sharply dentate lobes. The skin-like under-surface line is nearly parallel with the midrib, but distant from it. Raised from spores by Mr. Sim.

UNDULATO-MULTIFIDUM, *Lowe*. (Fig. 696.)—Length six inches, undulate, the apex multifid, though scarcely extending beyond the width of the frond.



Fig. 696.



Fig. 697.

MARGINATO-MONKMANII, *Lowe*. (Fig. 697.)—Marginate and interrupted from the lacerated margin of the frond, partially supramarginate. The apex multifid into four leafy, broad, divergent lobes, slightly, irregularly, and distantly dentate on the margin, with broad apices. Length thirteen inches, one half naked. The illustration is from Mr. Monkman.

CRISPUM-MARGINATUM, *Lowe*.—A dwarf *crispum*, bought

when very young by Mr. F. A. Edelsten; differing in the two inches of the apex being somewhat contracted, only slightly crisped and interruptedly marginate and dentate.

MARGINATO-POLYSCHIDES, *Lowe*.—Raised from spores by Mr. James, of Vauvert. Length twenty-one inches, width half an inch, except near the apex, where three quarters of an inch for the upper three or four inches. A very tall *polyschides*-looking variety with a marginal belt near the costa, except in the bulging apex where this line becomes submarginal and terminates an inch below the apex.

GLOMERATO-RAMOSUM, *Moore*.—Differing from *glomeratum* in the much more repeatedly branching stalks. Length eight inches, width across the head six inches.

LACINIATO-CORNUTUM, *Clapham*.—Found at Horton, near Rivaulx, by Mr. Thomas Hunton, of Rivaulx. Length seven inches, narrow, much laciniated and lobate, very narrow and submarginate at the base, widening to half an inch, with a broad normal rounded apex having the sori continued round like the spokes of a wheel. The costa ends half an inch below the apex in a horn. I am indebted to Mr. Clapham, for fronds.

MARGINATO-SAGITTATUM, *Lowe*.—A dwarf marginate irregular-outlined frond, with a pointed apex and a pair of barbed lobes at the base; resembling Fig. 604, but marginate.

SCALPTURATO-DISSECTUM, *Moore*.—Raised from spores by Mr. Elworthy. An irregular narrow-fronded form, having somewhat the appearance of *laceratum* but narrower, and the lacerations also long, narrow, and irregular. Length six inches, width one inch and a half to two inches near the base, and one inch near the apex.

MARGINATO-LATIPES, *Moore*.—Raised from spores by Mr. Elworthy. Length eleven inches, width nearly three quarters of an inch, with a wide base of an inch and a half. Marginate-dentate, copiously soriferous.

SUPRALINEATO-CONSTRUCTUM, *Moore*. (Fig. 698.)—A dwarf, narrow form, with an irregular margin. Supralineate.



Fig. 698.



Fig. 699



Fig. 700.

EROSUM, *Lowe*. (Fig. 699.)—A narrow erose form, with usually a multifid apex. Length eight inches, width one inch. Irregular outline, and here and there erose, interruptedly marginate, and dentate. The multifid cristate apex but little wider than the rest of the frond.

MARGINATO-CORDATUM, *Lowe*. (Fig. 700.)—Length seven inches. A narrow marginate muricate form, the margin of the

upper half of the frond being finely fimbriated, usually bidentate, except at the apex.

UNDULATO-BIFURCUM, *Lowe*.—Length twelve inches, slightly undulate, thin, four inches below the apex furcate, and one inch higher again furcate.

UNDATUM, *Padley*.—Found near Littleham by the Rev. C. Padley. Length eleven inches, width one inch and a quarter. Nearly uniform or strap-shaped. Rounded at the base and subcornute at the apex. The undulations more like waves, a quarter to half an inch apart, then crisped or undulated. I am indebted to the Rev. C. Padley for fronds.

IMBRICATO-CONTRACTUM, *Clapham MSS*.—A broad form with an irregular outline. Slightly undulate, lobate and imbricated. The centre of the frond contracted, but not excessively so, and where contracted densely denticulate. Apex blunt, except when minutely denticulate, then blunt with an abrupt attenuation.

MURICATO-CRISPUM, *Lowe*.—A pretty dwarf form. Fronds eight inches in length, widest at the base, and gradually tapering to the apex. Muricate on the upper surface, within which to the costa smooth, without the muricate belt beautifully crisped. Copiously soriferous, except near the base, and also suprasoriferous near the apex.

MUCRONATUM, *Willdenow*.—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. Fronds dwarf, the lamina from one to three inches in length, and less than an inch broad. Base subcordate, uniform in width throughout the frond, the apex bluntly rounded. Margin undulate and denticulate, the costa excurrent, forming a horn which projects from the upper surface. Fronds sterile.

DEORSO-CRISTATUM, *Sim*.—Length twelve inches, width one inch, scarcely spreading, strap-shaped, forked near the apex, the forkings turning down and crossing each other, their apices crispy, much cut, and compact.



Fig. 701.

Fig. 702.

LACINIATUM, *Wollaston*. (Fig. 701.)—Length eighteen inches. Narrow, except near the apex, then normal in width, with an acuminate apex. The narrow portion finely lacinated. My thanks are due to Mr. Elworthy for fronds.

LOBATUM-RAMOSUM, *Lowe*. (Fig. 702.)—Length thirteen inches, of which the basal three inches is the stipes. Lobate, and branching at the base of the rachis into twin fronds, the apex being inconspicuously ramose.

MACROSORO-CORNUTUM, *Lowe*.—Raised from spores of *macrosorum* by Mr. James, of Vauvert. Length five inches. It retains the character of *macrosorum* with a highly-developed property of *cornutum*, the horn which starts within the lamina extending as a curved thorn an inch beyond the rounded apex of the frond.

CRISPUM-AMPLUM, *Lowe*.—Found by Mrs. Hole, of Parke Bovey Tracy, and communicated by Mr. James, of Vauvert. A magnificent *crispum*, with fronds eighteen inches long and four inches broad, deeply and densely frilled, and having a crenate margin. Base lobate, apex multifid, and frilled in the same direction as the frond, and not extending beyond the general outline, so as to be scarcely perceived in a dried frond.

FINDENDUM, *Lowe*.—Found near Marwood by the Rev. F. Mules, and in North Devon by the Rev. C. Padley. Length ten inches. Normal, except that two inches below the apex the costa is split and twisted awry from the centre, forming a pair of multifid apices with an open space between them.

ABRUPTO-CRISPUM, *Lowe*.—Length twelve inches, width one inch and a half at the apex, and half an inch at the base. Cornute half an inch below the apex, the margin crisped.

CRISPUM-ANGUSTUM, *Lowe*.—Length fifteen inches, width one inch and a half. A narrow form of *crispum*, with a naked stem six inches in length. Fronds sent by the Rev. C. Padley.

CRASSIFOLIUM, *Sim*.—A curious ugly form. Length six inches, width one inch, tapering, thick textured. Slenderly lined on the under surface.

CRISTATUM-MINUS, *Sim*.—Length three to four inches, width three quarters of an inch, wavy, with a crested apex intermediate between *crista-galli* and *cristatum*.



RAMOSUM-MAJUS, *Clapham*. (Plate LV.)—Found at Haburn Wike, near Scarborough, by Mr. E. Woodall, and raised from spores by Mr. Clapham, of Settle. Fronds eighteen inches long; stipites very thick, and branching into several broad fronds, cordate below, apex attenuated, somewhat undulate and crenate, the multifid tufts frequently crossing each other. For fronds I am indebted to Mr. Clapham, of Scarborough; Mr. Monkman, of Malton; and Messrs. Stansfield, of Todmorden.



Fig. 703.



Fig. 704.

RAMO-PROLIFERUM, *Clapham*. (Fig. 703.)—Raised from spores by Mr. Clapham, of Scarborough. Two or three branched below, each three inches in length, dividing in the middle into two divisions, and again dividing and the apices split. Marginate and coarsely serrated. Width less than a quarter of an inch. Similar forms have been raised from spores by the late Mr. Jackson and myself. A pretty dwarf form.

RAMO-PALMATUM *Lowe*. (Fig. 704.)—Length three inches. Twin-fronded at the base, decurrent, almost naked to the costa, except an inch below the apex, where each expands into hand-shaped, deeply lacerate multifid heads, more than an inch in width. In the sinuses of the lacerations at the base is a thin transparent skin-like membrane.

FISSUM, Moore.—Length twelve to eighteen inches, width one inch. Erect. Slightly wavy, and the margins cut into broad lobes half way to the costa, the margins crenate.

FLAVO-TINCTUM, Moore.—Length ten to fifteen inches, narrowish, spreading, somewhat wavy, with a two or three times forked branched head. Yellowish green near the midrib.

GEMINUM, Sim.—Length four to six inches, width half an inch. Very spreading, twin-stalked, fronds short, above twin-branched, and these again twin-branched. The ultimate ones angularly-lobed.

GLOMERATO-DIGITATUM, Sim.—Length four to six inches, width less than an inch. Raised from spores by Mr. Sim, of Foot's Cray. Strap-shaped, and with an apex like *glomeratum*, or repeatedly forked-branched, flattened, fan-shaped, crispy head.

HASTATUM-MAJUS, Elworthy.—Length six to nine inches, width two inches. Nearly erect, long-stalked, stout fronds, widest at the base, where there are arrow-barb-like lobes. The upper half crenate.

LACERATO-MARGINATUM, Sim.—Length two to four inches, differing from *laceratum* in the clefts of the fronds being sub-marginate, especially near the apex.

MARGINATUM-PYGMÆUM, Sim.—A pygmy variety. Length one to two inches, width one eighth to one quarter of an inch. A miniature of *marginatum*, with other very short, rounded, cornute fronds.

RAMO-MARGINATUM-PROLIFERUM, Sim.—Length two to three inches. Broader, more leafy, scarcely marginate, tufted form of *ramo-marginatum*, bearing numerous tiny bulbils on the upper surface.

MARGINATO-CRISPULUM, Lowe.—Slightly crisped without the marginal belt, and denticulate along the margin. The marginal belt a quarter of an inch within the frond, and terminating four inches below the apex, where the margin is more irregular

and lobate. Increasing in width from the base to near the apex, which is rounded. Length sixteen inches, width from three quarters of an inch to three inches. Fronds were forwarded by the Rev. C. Padley.

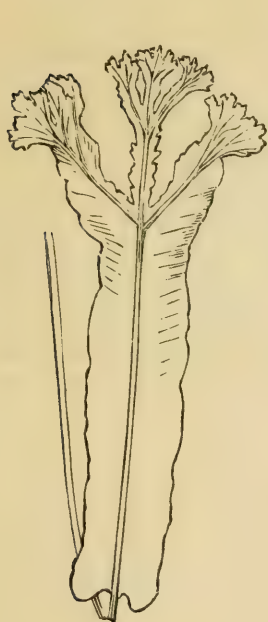


Fig. 705.



Fig. 706.

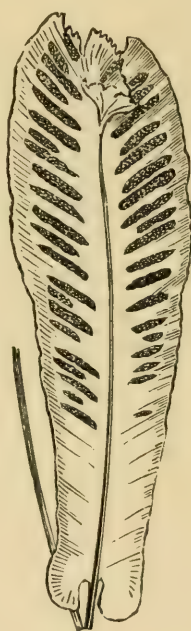


Fig. 707.

ANTRORSO-CRISTATUM, *Lowe*. (Fig. 705.)—Found by Mr. Foot, of the Ordnance Survey of Ireland, in the Burron. Length twelve inches, of which half is the naked stem, then normal, except the branching-crested apex, which is depauperate, more especially in the centre branch.

POSTGATEANUM, *Willison*. (Fig. 706.)—Found by Mr. Postgate, near Whitby. Length eight inches; to within three inches of the apex more or less normal and one inch and three quarters wide; here are two rounded lobes similar to those at the base, and above this extends a narrow forked portion with serrated margins and minutely crisped apices. Sometimes the whole frond is lacerate.

ACCISUM, *Lowe*. (Fig. 707.)—Found in Devonshire by Mr. W. Edwards, of Nuthall, Nottinghamshire. A somewhat dwarf, curious form, almost normal except at the apex, where cut away, and the costa terminating in a frilled leafy apex within the frond.

CRISTATUM-RAMOSUM, *Moore*.—Found at Smeersset, Yorkshire, by Mr. A. Clapham, of Ramsdale Bank, Scarborough. The stipites branched, and the apex of the fronds crested into a fine handsome tuft, but not capitately crested.

CRISTATUM-NANUM, *Moore*.—Found in Guernsey by Mr. J. James, of Vauvert. A very handsome, dwarf, crested form. Length of frond five inches; the base of the frond is half an inch wide, cordate, and normal for one inch and a half, then spreading out into a much-branched tuft of narrow divisions, the ultimate segments terminating in blunt divaricate teeth. The tuft is four inches in width.

CRISTATUM-TRANSVERSUM, *Moore*.—Found at Minehead, in Somersetshire, by Mr. W. Bowden, and now in the possession of Mr. G. B. Wollaston. Length of frond nine inches, width more than an inch. Base cordate, forked towards the apex, with laterally twisted branches crossing each other, the branches being multifid and cristate.

RAMO-SUBMARGINATUM, *Moore*.—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. A broad form, with fronds eight or ten inches in length, ramose in the stipes or lower portion of the costa. It resembles *ramosum*, but is *submarginate*.

POLYCUSPIS-UNDOSUM, *Moore*.—Found at Giggleswick Sears, near Settle, by Mr. Stansfield, and near Doncaster by Mr. S. Appleby. A dwarf narrow form of *polycuspis* multifidly branched, the ultimate segments forming simple attenuate points; the whole of the multifid portions being curled or twisted.

VARIABLE-CRISTATUM, *Moore*.—Found near Barnstaple, in Devonshire, by the late Mr. C. Jackson. A handsome form of

variabile, dividing in the lower portion of the costa, and spreading out by repeated contiguous forkings into a bunch six inches across, the tips of the ultimate lobes being cristate. Length of frond six inches. Fertile in the upper portion.



Fig. 708.

CONCAVO-RAMOSUM, *Lowe*. (Fig. 708.)—Raised from spores by Mr. Clapham, of Scarborough. Length six to seven inches. Fronds twin, dividing at the base of the stipites; the leafy portion only about two inches in length, branching at the base, and branching and multifid at the apex, but scarcely dilated beyond the general outline of the frond, the fronds being concave. Lamina equal in width from the base to the apex, the margin irregularly and shallowly cut.

MULTIFURCATUM, *Moore*.—Found at Orchardleigh Park, Frome, Somersetshire, by Mr. W. P. Ayres. A dwarf variety, truncate at the base, bearing in the lower part a few distant, acute, linear, projecting segments, more than half an inch in length. Higher up the lobes are larger and longer, and become

multifid, spreading out into numerous flat pointed segments; the apex also multifid, with several times divided branches, and the segments short.



Fig. 709.



Fig. 710.

LACERATUM-MONKMANII, Moore. (*Pinnatifidum*, Stansfield.) (Fig. 709.)—Raised by Mr. Monkman, of Malton, from spores. Dwarf, erect growing, densely tasseled. Differing from *laceratum* in being nearly equal in width, that is, a lacerated strap-shaped frond. Length six inches, width three quarters of an inch. I am indebted to Mr. Monkman for a frond.

KEPHALOTON, Lowe. (Fig. 710.)—Found in Devonshire. Length nine inches, width an inch, unevenly lobate, the costa branching into a large, flat, much lacerated leafy head six inches across. A distinct form.

INVERSUM, *Lowe*. (Fig. 711.)—Length eight inches. A singular, pinnate, depauperate, lobate, dentate form. Very irregular in outline, and furcate near the apex.



Fig. 711.



Fig. 712.

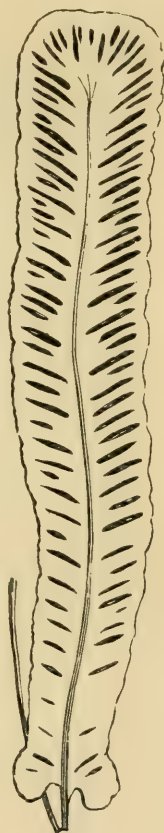


Fig. 713.

SUBCORNUTO-LACINIATUM, *Clapham*. (Fig. 712.)—A subcornute variety, with an irregular outline much lacinated, the apex more or less blunt. Raised from spores by Mr. Clapham.

HERETATUM, *Lowe*. (Fig. 713.)—Length fifteen inches, width one inch and a quarter at the base, and gradually widening to two inches and a quarter at the extreme apex, which is rounded,

and almost flat at the extremity, the sori being continued uniformly round the apex, like the spokes of a wheel; one inch below the apex the costa terminates in a subcornute indistinct point.

APICULOBUM, Moore.—Found in Guernsey by Mr. J. James, of Vauvert. Dwarf, variable-fronded form, with fronds three to five inches long and two inches broad, widest upwards, the costa not extending to the apex, which is blunt and rounded in outline. Base cordate, margin undulate, sometimes cut so as to form a rounded lobe, and the apex profoundly cut into several obovate lobes.

ELATO-LOBATUM, Moore.—Found at Littlehampton, Sussex, by Mr. G. B. Wollaston. A tall, stout, erect variety, with fronds two feet in length, divided into two or three branches at the apex, the branches being either divergent or convergent and transverse.

FURCATUM, Wollaston.—Cultivated by Mr. Cox, of Redleaf. The apex of the frond split exactly down the midvein, the divisions crossing in a curved manner, and the forks curving like the upper mandible of a parrot, occasionally dividing in the same way over and over again. The lower portion of the frond normal.

DIVARICATUM, Moore.—Found in Westmoreland by Mr. J. Crossfield, and at Oldstead, in Yorkshire, by Mr. C. Monkman. Normal below, dividing near the apex into two branches, which spread out at a wide angle, and these fork again in the same manner.

RAMOSO-GLOMERATUM, Moore.—A lovely dwarf form. Stipites ramose, producing several branches, which are again ramose from the very base of their lamina, branching out into several so much dilated divisions as to form rounded, densely-crisped, obtuse-looking tufts, with bluntly-crenated margins. The fronds consisting of a series of five or six of these dense glomerate frilled masses all brought together into one head. Found by Mr. James in Guernsey.

CACUMENE, *Lowe*. (Fig. 714.)—Length twelve inches, widest in the centre of the frond. The margin irregular, lobate and lacerate, the apex contracted and forming a head of narrow divergent lacerated flat branches. Found by Mr. W. Edwards, in Devonshire.

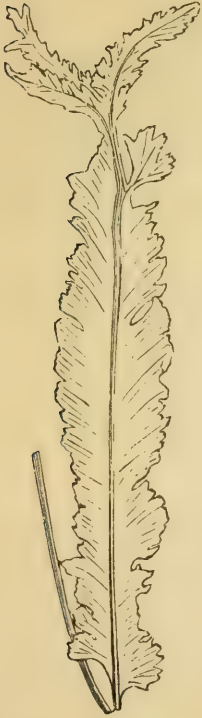


Fig. 714.



Fig. 715.

LACERTUM, *Lowe*. (Fig. 715.)—Found at the Woodlands, near Whitby, by Mr. W. Willison, of Whitby, and called by him "The Lizard," hence the adoption of *Lacertum*, from the fact that the apex of the frond frequently resembles the tail of the lizard, and the lobes bear some resemblance to the paddles of this reptile. The illustration is from Mr. Willison.

POLYCUSPIS-ANGUSTUM, *Moore*.—Raised from spores in 1863 by Messrs. Stansfield, of the Vale Nursery, Todmorden. A
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dwarf Fern, six inches long, not unlike the figure of *ramosum*, narrow and interrupted, with a compact, many-pointed, circular head, much lacerated on the margins.

CRISTA-GALLI, *Wollaston*.—Found some years ago at Glanville's Wootton, in Dorsetshire, by Mr. G. B. Wollaston, and more recently at Nettlecombe by Mr. Elworthy, at Malham by Mr. Stansfield, and on Whitbarrow by Mr. F. Clowes. Allied to *multifidum*, but differing in the apex, being a complicated folding rather than a complicated dividing of its parts. Length of fronds twelve or fourteen inches and one and a half to two and a half inches broad, cordate at the base, more or less undulate below, the margin crenate, and the apex forming a compactly crispy tuft.

DEPAUPERATUM, *Wollaston*.—Raised from spores by Mr. G. B. Wollaston. A remarkable form of *digitatum* curiously deformed, having instead of fronds little else than their mid-ribs, which form subulate points one to two inches long, which are simple, bifid, or multifid. Occasional large digitate fronds are produced.

POLYSCHIDES, *Ray*, (*angustatum* and *angustifolium* of gardens.)—A narrow-fronded form, known even as early as the time of Ray. More recently it has been found at Lismore, Bristol, Fareham, Edlington, Ilfracombe, and in Guernsey. Fronds narrow, strap-shaped, having numerous deep incisions on its margins; irregularly crenately-lobed, the base subtruncate. Sori irregular, short, and linear. Length of frond from six to twelve inches, width three quarters of an inch.

VIVO-POLYSCHIDES, *Clapham*, (*fæcundum*, Sim.)—Raised from spores by Mr. Clapham, of Ramsdale Bank, Scarborough. Remarkably prolific when young, Mr. Clapham having counted as many as sixteen bulbillæ on a single young plant. Fronds narrow, irregularly sublobate, and crenately dentate. A form of *polyschides*.

LINEATO-MULTIFIDUM, *Lowe*.—Raised at Nettlecombe by Mr. C. Elworthy. Length of frond six to seven inches. Exceed-

ingly narrow, and fertile along the margin. The apex much branched, and the divisions very narrow. Fertile also along the margins of the branched portions. The margins inconspicuously lacerate.



Fig. 716.

CONSTELLATUM, *Lowe*. (Fig. 716.)—Raised by Mr. Glave, of Scarborough. Length six inches. The stem branching at the base, then twin-fronded an inch above the base, and these ramose; the lamina narrow and depauperate, and the apex densely crested.

DETECTUM, *Moore*.—A dwarf form, the stipites dividing in the upper half, and the branches re-dividing several times. Sori destitute of an indusium. Raised from spores by Mr. Elworthy.

HASTATUM, *Moore*.—Found in Guernsey by Mr. James, of Vauvert. Dwarf, from three to five inches in length. Frond narrow, broadest in the middle, the base spreading out into a pair of oblong, acute, divergent lobes more than an inch long and three eighths wide. The margin unequally crenato-lobate, and the apex multifid. Suprasoriferous. There is a dwarf

form, broadest at the base, only slightly multifid, and less crenate. Found at Hazelwood, Sligo, by the Rev. W. R. Bailey.



Fig. 717.

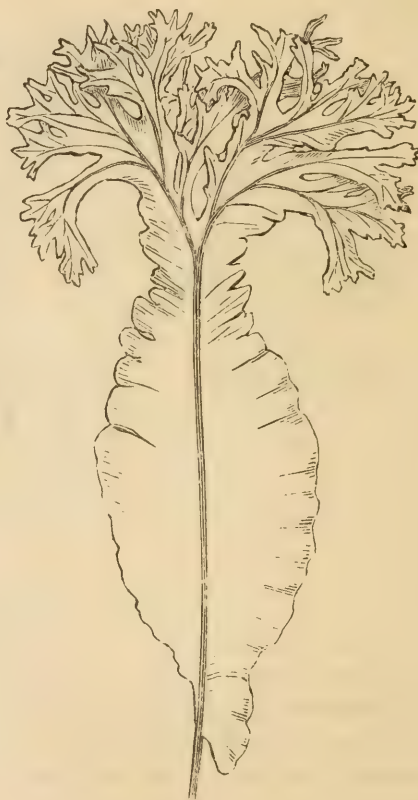


Fig. 718.

TIARÆFORME, *Lowe*. (Fig. 717.)—Found in Devonshire. A large form. Length eighteen inches, width two inches and a half; thick, slightly crisped and distantly incised on the wavy margin; five inches below the apex branching into a turban-like multifid head. Sori large, bold, and abundant. A distinct variety.

CORONARE, *Lowe*. (Fig. 718.)—Raised from spores at Highfield House. More or less oblong-ovate, base usually lobate on

one side only, slightly undulate near the margin, and crenate below the contracted part, where the costa divides into a numerously branched flat head, four inches across; the margins lacinate, with open sinuses. Length of frond nine inches.

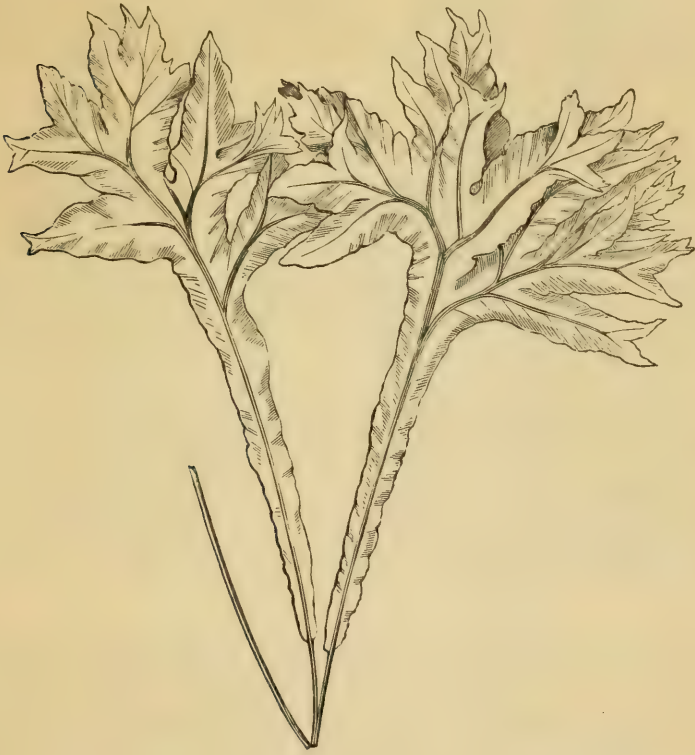


Fig. 719.

CONJUNGENDUM, *Lowe*. (Fig. 719.)—Found in Devonshire by the Rev. F. Mules. A distant form, with fronds of thin substance. The stem forked near the base into twin fronds, narrow, nearly strap-shaped, with a smooth uncut margin, and a much-branched, leafy, multifid head, the extreme apices angular and pointed. Length thirteen inches, of which the basal four inches and a half is naked. Three inches below the apex branching, the width across the twin heads eight inches.

SAGITTIFOLIUM, *Wollaston*.—Found at Littlehampton, Sussex, by Mr. G. B. Wollaston; at Whitby by Mr. A. Clapham, of Scarborough; Roche Abbey, Yorkshire, by Mr. S. Appleby; Fremington, Devonshire, by the late Mr. C. Jackson; and in the counties of Clare and Kerry by Dr. Allchin. Characteristic from the auricled portions of the base of the frond being elongated, each with a distinct midrib, and directed downwards as with the barbs of an arrow. In other respects more or less normal.

LACERATUM-DISSECTUM, *Moore*.—Raised from spores by Mr. C. Elworthy, of Nettlecombe. Dwarf. Length of frond four to six inches. Fronds singularly dissected, sometimes flabellate, as broad as long, and divided down to the costa into three segments, each of which are profoundly divided into broad cuneate inciso-dentate segments. Sori produced on the margins of the sinuses.

LACERATO-ELEGANS, *Moore*.—Raised from spores by Mr. W. Willison, of Whitby. A singular form. The fronds forming an irregular mass six inches in length and four inches in width. The fronds are divided irregularly quite to the costa into several divisions, which are again profoundly cleft-lobed, dilated, and crispy at the apices.

LIMBOSPERMUM, *Moore*.—Found near Nettlecombe by Mr. C. Elworthy. A singular form, with coriaceous fronds. Length eight or ten inches, and one inch and a half wide near the base, narrowing to the apex, and becoming forked slightly below the point, with the branches forked at their tips. Base usually subtruncate. The margins slightly irregular, with projecting lobes pointing forwards. Obscurely dentate. The sori very short, and often dot-like, and situated on the extreme edge, forming an irregular, narrow, marginal line. Slightly suprasporiferous. *An illustration is unnecessary.

MARGINATO-CORNUTUM, *Moore*.—Raised from spores both by Mr. Wollaston and the late Mr. C. Jackson. Fronds from three to six inches in length. Base subtruncate, narrowish, oblong, apex blunt and rounded, the margin numerously lobed, the

lobes narrow. The under side of the frond has an excurrent soriferous membrane, and the costa terminates in a horn.



Fig. 720.



Fig. 721.

CORNUTO-LACERATUM, *Monkman*. (Fig. 720.)—A dwarf *laceratum*, which is cornute. Length five inches, one half being the stipes. The illustration is from Mr. Monkman.

LATUM, *Lowe*. (Fig. 721.)—Length twelve inches, width four inches. Slightly crisped, outline irregular, near the apex naked to the costa, apex of the costa cornute. This differs from *latifolium*, the latter variety being thirteen inches long, and nearly five inches wide, with spore-cases as much as two inches in length.

SINUATUM, *Wollaston*.—Found at Ilfracombe by the Rev. J. M. Chanter; at Nettlecombe by Mr. C. Elworthy; Littlehampton by Mr. G. B. Wollaston; Ashdale, near Helmsley, and Moughton,

near Settle, by Mr. A. Clapham; Kirkham Abbey, Oldstead, and Malton by Mr. C. Monkman; Whitbarrow by Mr. G. B. Wollaston; Ruthin by Mr. T. Pritchard; and Guernsey by Mr. J. James and the late Mr. C. Jackson. Large growing and irregular. In some the margin is sinuated with irregular-sized lobe-like projections. Sometimes irregular portions contracted with brief teeth or shallow lobes, and sometimes with large oblong projections. The contracted parts are occasionally crisped. The base, apex, or one side only of the frond occasionally altered. The base mostly imperfectly developed; the apex attenuate and occasionally multifid. All the fronds differ from each other. Sori normal. Length of frond eighteen inches, width in the lower portion from a half to three quarters of an inch, in the upper half one inch and a half.

SAGITTATO-LOBATUM, *Moore*.—Found at the Woodlands near Whitby by Mr. W. Willison. Differing from *sagittato-cristatum* in having longer and more acute basal lobes, directed downwards. The apex branching into a tuft of flat acute segments, below which the margin is crenate-lobate.

LACERATO-RAMOSUM, *Moore*.—Raised from spores by Mr. Elworthy, of Nettlecombe. A pygmy form, with fronds two inches in length and two inches in width. Stipites two or three-branched, and each branch multifidly forked, the ultimate divisions blunt and dentate. Slightly marginate beneath. Another similar form, but more flabellate, has been also raised by Mr. Elworthy.

STRIATUM, *Moore*.—Found in Guernsey by Mr. James, of Vauvert, and more recently at Barnstaple and at Littlehampton. Fronds broad, sublanceolate, indistinctly crenate, and to some extent undulate. The peculiarity being obliquely streaked with yellowish green on a deep green, giving a striated appearance.

PERAFERO-CORNUTUM, *Moore*.—Raised from spores in 1857 by Mr. James, of Vauvert. Dwarf. Fronds three inches high, including the stipites, cordate at the base, slightly undulate, rounded and retusely bi-lobed at the apex. At the base of the apical cleft the costa is excurrent and horned, and around

the lower portion of the horn, on the under side of the frond, is a frilled funnel-shaped cup three quarters of an inch in diameter.

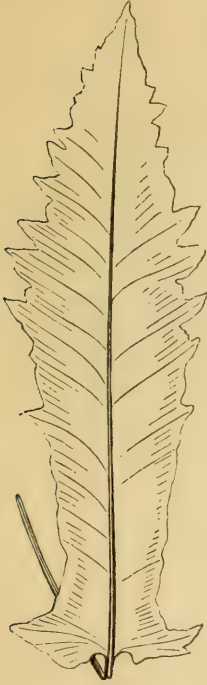


Fig. 722.



Fig. 723.

SAGITTATUM, *Allechin*. (Fig. 722.)—Found at Tiverton by the Rev. C. Padley. Length twelve inches, broadest in the centre. Sagittate, the apex blunt-pointed, pointed lobes at the base, and the margin irregular from the conspicuous pointed lobes, which project beyond the general outline. The general outline of the frond somewhat resembling a Roman sword. My thanks are due to the Rev. C. Padley for fronds.

GRANDICEPS, *Lowe*. (Fig. 723.)—A large-growing form, branching in the centre of the frond, where the costa is

cornute, into a large and a small much-branched very leafy double head. Its origin is obscure.



Fig. 724.

GLOMERATO-VARIABLE, *Monkman*. (Fig. 724).—Raised from spores by Mr. Stansfield, of Todmorden, and now in the possession of Mr. Monkman, of Malton. Length sixteen inches, of which the basal six inches is naked. Varying in width across the head from six to ten inches. No two fronds alike. Sometimes a simple frond, others a bifid, others closely resembling *glomeratum* in whole or in part, sometimes half the division will be like *glomeratum*, and the other repeatedly branched, with normal-looking divisions. The illustration is from Mr. Monkman.

FALLAX, *Moore*.—Found at Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston. Dwarf. Fronds somewhat wavy, the

whole surface having a dull mealy appearance, roughish and lustreless, being discoloured in streaks.



Fig. 725.



Fig. 726.

MURICATUM-TENU, *Padley*. (Fig. 725).—Found in Devonshire by the Rev. C. Padley. Length nine inches, of which the lower six inches is the naked stem, then narrow, lacerated, muricate, crisped, and supra-marginate near the edge, higher up the lamina expanding beyond the marginate belt for a short distance and then terminating. The apex contracting, lacerate, muricate, and supra-marginate. Fronds irregular in form. I am indebted to Mr. Edwards, of Nuthall, for a plant.

PLECOMENON, *Lowe*. (Fig. 726).—Raised from spores in the Fernery at Highfield House. Length of frond six inches. Twin-fronded, irregularly branching, the outline very irregular, and usually broadly bidentate.

LATO-MULTIFIDUM, *Moore*.—Found at Wood Plumptre, near Bristol, by Mr. Stansfield. Length of frond six or seven inches,

width two inches and a half in the basal normal portion. The apex more or less repand, and multifidly divided into numerous segments.

ELEGANS, Moore.—Found at Castle Howard, Yorkshire, by Mr. C. Monkman, of Malton. Length of frond nine inches, with a stipes of five inches. Fronds narrowish, but irregular in width, occasionally with prominent lobes, usually wavy in outline, with a crenate-dentate margin, which is minutely crisped.

POLYSCHIDES-PYGMÆUM, Moore.—Raised from spores by Mr. Clapham, of Ramsdale Bank, Scarborough. Undulate, occasionally furcate at the apex. Base of frond truncate or cordate, and the frond irregularly contracted. Fronds only two or three inches high.

SAGITTATO-CRISPUM, Moore.—Found at Petersfield, Hampshire, and at Ottery St. Mary, Devonshire, by Mr. G. B. Wollaston, and at Barnstaple by the late Mr. C. Jackson. Large-growing and handsome. Length of frond twelve to fourteen inches, width three inches. Much undulated and crenately-lobed, the base elongated into a pair of acute lobes, combining the characters of *sagittifolium* and *crispum*. Copiously soriferous.

SAGITTATO-LACERATUM, Moore.—Found near Whitby by Mr. J. Willison. Dwarf. Fronds much frilled, having arrow-shaped basal lobes and a dilated apex. The divisions of the frilled margins lacerate, the lobes being longish and acute.

CRISPUM-IRREGULARE, Moore.—A garden variety, curiously lobate, the fronds having three or four reniform lobes at the base, the margin here and there profoundly divided and irregular, some parts laciniate, and there submarginate. Fronds frequently dwarf, and occasionally cornute, with a blunt terminal lobe.

UNDULATO-PROJECTUM, Moore.—Found at Mulgrave Castle, Yorkshire, by Messrs. Stansfield, of Todmorden. Curious, broad, somewhat undulated form, with cordate base, remarkable for the production of distant, projecting, pointed, marginal

lobes, half an inch or more in length, and sometimes split into three or four linear tooth-like divisions.



Fig. 727.

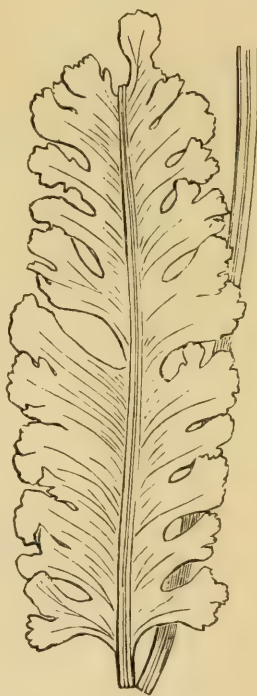


Fig. 728.

CLAPHAMII, *Moore*. (Fig. 727.)—Found at Grassington, Wharfedale, Yorkshire, in 1857. Fronds fifteen inches long and two inches broad; at the base a pair of narrow acute lobes; margin crisped and irregularly sub-lacinate, the apex multifoldly branched, and the branches multifid. My thanks are due to Mr. Clapham for a plant.

ALTO-LOBATUM, *Lowe*. (Fig. 728.)—Length ten inches, of which one half is the naked stem; width two inches, nearly equal throughout the frond, ending abruptly and cornute; deeply lobate. The illustration is from the Rev. C. Padley.

STEPHANOTES, *Lowe*. (Fig. 729.)—Raised from spores at Highfield House. Length of frond three inches. Twin-fronded. In some respects resembling *ramo-proliferum*, differing in the more leafy character of all its parts.



Fig. 729.



Fig. 730.

PALMATUM-MARGINATUM, *Willison*. (Fig. 730.)—A dwarf triangular frond having a blunt apex, leafy with a lacerated margin. Length two inches and a half. Raised from spores by Mr. Willison, and a similar one by Mr. Elworthy.

PROJECTUM, *Moore*. (Fig. 731.)—Found at Ilfracombe by Mr. J. Dadds; Nettlecombe, by Mr. C. Elworthy; Kendal, by Mr. J. Crossfield; Newick, by Mr. Selater; Tenby, by Mr. Bloxam; and Scarborough, by Mr. Stansfield. Large, growing nearly two feet in length, and two inches and a quarter wide, except across the projecting lobes, where four inches. Base cordate or sub-sagittate; margin plain below and undulate above, narrowing to the base; apex attenuate. The peculiarity consists in the broadish, acute, pointed lobes, which here and there project an inch beyond the general outline of the frond. These projections are confined to the upper half of the frond. The illustration is from Mr. C. Elworthy.

POLYMORPHON, *Lowe*. (Fig. 732.)—Found in Devonshire by the Rev. C. Padley. Length sixteen or seventeen inches. Lobate on one side of the base only, increasing in width to

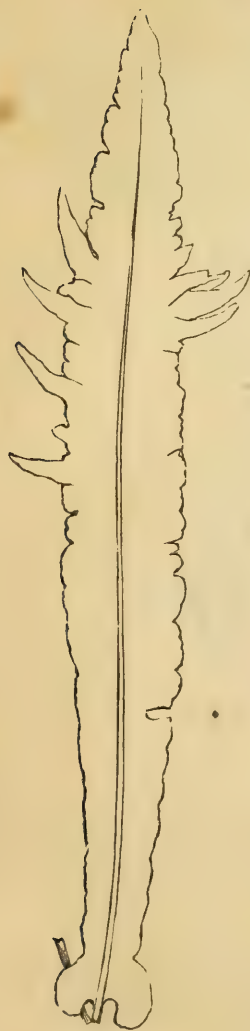


Fig. 731.



Fig 732.

the centre of the frond, where two inches and three quarters wide. Two inches and a half below the apex the costa dividing and forming a compact, multifid, leafy head, six inches wide, composed of leafy angular-pointed segments. Soriferous only on the multifid portion. The illustration is from the Rev. C. Padley.



Fig. 733.



Fig. 734.

UNDULATO-VARIANS. (Fig. 733.)—Normal in size. Undulate but variable in form, sometimes depauperated, leaving wide open spaces to the costa, at others deeply and irregularly cut. Base and apex also variable. Length nine inches.

DACTYLOTON, Lowe. (Fig. 734.)—Raised from spores by Mr. R. Edwards, of Nuthall. Length twelve inches, of which the



basal two inches and a half is naked, lamina somewhat narrow, strap-shaped and with a smooth margin, three inches from the apex branching into half a dozen digitate branches each as wide as the other parts of the frond, and their margins regularly crenate, their tips minutely crested, having an oak-leaf character.

SUPRASORIFERUM, *Lowe*. (Plate LVI—A.)—A form of the variety *crenato-lobatum* of Moore. Crenately lobed on the margin, bearing sori on the upper as well as on the under surface of the frond; below the sori bold. Crenately lobed. Fronds broad. Length twelve or more inches, breadth from one to two inches. Forms of this Fern have been found in many places in Great Britain. My thanks are due to Mr. Stansfield, of Todmorden, for fronds.

CONTRACTUM, *Wollaston*. (Plate LVI—B.)—Found in Clare, Ireland, by Dr. Allchin, in Guernsey by the late Mr. C. Jackson, at Smeerset by Mr. A. Clapham, at Nettlecombe by Mr. C. Elworthy, and at Ruthin by Mr. Pritchard. Length of frond six to ten inches, cordate at the base, and normal in the lower part, the apex being densely flabellate-multifid-crisped. Just below the multifid apex the frond is distinctly contracted to one half the breadth, and having in this part a ridged appearance. The apex is somewhat submarginate. Sori in the crenatures, slightly suprasoriferous, as well as on the under side of the frond. My thanks are due to Messrs. Stansfield, of Todmorden, for fronds.

CRISTATO-DIGITATUM, *Sim*.—Length six to fourteen inches. Simple or twin-branched fronds, terminating in circular flattish elegant crests, undivided except on its margin, and there very crispy dentate.

FISSUM-RESECTUM, *Stansfield*.—Found in North Lancashire. A form of *fissum*, wanting the basal lobes, which are as if cut off upwards.

CONTORQUERE, *Lowe*. (Fig. 735.)—Found at Ilfracombe by Mr. Dadds. Length five inches, width from a quarter to three quarters of an inch. A singularly distorted form, the

costa branching in the centre at right angles both right and left. Interruptedly marginate, partially lobate, and closely serrate on the margins. The illustration is from the Rev. C. Padley, of Beaconfield, Plymouth.



Fig. 735.



Fig. 736.

SUPRALINEATO-CORNUTUM, *Clapham*. (Fig. 736.)—Raised from spores by Mr. A. Clapham, of Ramsdale Bank, Scarborough. A supralineate form with a cornute costa. My thanks are due to Mr. Clapham, for fronds.

CARINATUM, *Appleby*.—Fronds keeled, and beautifully wavy. I have not seen this form.

FÆCUNDUM, *Appleby*.—An elegant dwarf form, well crested and bearing little plants upon its fronds.

MARGINATO-FISSILE, *Sim*.—Length fourteen to eighteen inches, closely resembling *fissile* in the varying width, dentation and irregular lobing of the fronds, which have a skin-like

line beneath, following the irregularity of the margin as in *submarginatum*, and almost as marginate as *marginatum*.



Fig. 737.

RAMOSO-CRISTATUM, *Moore*. (Fig. 737.)—Raised from spores by Mr. Clapham, of Scarborough. A very handsome form. The fronds ramose, the apices of the branches multifid, the segments

crested in a crisped manner. I am indebted to Mr. Clapham for fronds.

MARTYNIANUM, *Stansfield*.—Found in 1863, in County Clare by Mr. A. Stansfield. Length ten inches, width scarcely an inch in the contracted basal half of the frond, and one inch and three quarters in the upper half. Stem lengthy, costa flexuose, the contracted portion fimbriate, the upper half normal on one margin, and irregularly lobate on the other. Apex pointed, dwarfer than *laciniatum*, and more deeply cut. My thanks are due to Messrs. Stansfield for fronds.

ANGUSTATO-MARGINATUM, *Wollaston*.—Found at Craven, in Yorkshire, in 1861, by Mr. A. Stansfield. Length eleven inches, width three quarters of an inch. An interesting very narrow marginate form, the continuous line being near the margin on the under side.

CRENULATUM, *Stansfield*.—Found in many places. Length nine inches. Normal, except having a submarginal line, beyond which crenulate. Sori more or less oval, and situated along this line. Apex pointed. Fronds less, and narrower than the normal form.

ALCICORNE, *Stansfield*.—Raised from spores in 1858 by Messrs. Stansfield, of Todmorden. Dwarf, undulate, stipes somewhat flexuose. Sometimes bifid, and having irregular horn-like projecting lobes near the apex, both along the margin and apex. Length seven inches. Fronds widening to the apex.

VARIEGATUM, *Moore*. (Figs. 738 and 740, and Plate LXIV.)—There are several forms of this Fern, one dwarf, and in the possession of Mr. Clapham, called *variegatum-Claphami*, (see plate LXIV—B,) is sometimes beautifully variegated with white, but it is only subpermanent. The apex is dilate. Another dwarf form, called *variegatum-Willisonii*, (see fig. 740,) is variegated with yellowish white, and only subpermanent: both these are from North Yorkshire. A third has been found by Mr. Elworthy, *variegatum-Elworthii*, (see fig. 738,) is a handsome permanent variety of a narrow normal form, and much variegated.



Fig. 738.



Fig. 739.

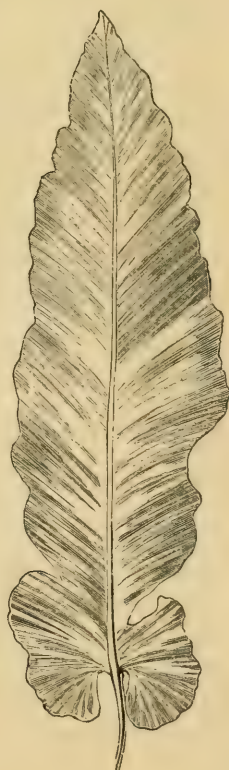


Fig. 740.

FISSUM-VARIEGATUM, *Lowe*. (Fig. 739.)—A handsome form, with fronds narrow at the base and wide near the apex, but becoming rapidly acute to the tip. It differs from *fissum*, more especially in being variegated.

UNCINATUM, *Moore*.—Found in 1863 in County Clare by Mr. A. Stansfield. Length eleven inches, width two inches. Colour rich green. Frilled, like *crispum*. Apex round-pointed. Costa crooked, the basal lobes twisted in the way of a hook.

FLAVO-TINCTUM-PAPILLOSUM, *Clapham*.—Somewhat broader and more irregular than *papillosum*. Rich green, tinged with yellow. Length nine inches, width from one inch to one inch and a half.

IRREGULARE-MAJUS, *Stansfield*.—Found in 1861, in North Devon, by Mr. R. Moule. Not differing from *irregulare* except in being larger.

LIMBOSPERMO-CRISTATUM, *Wollaston*.—Raised at Vale Nursery from *limbospermum*, in 1862, by Messrs. Stansfield. Like the parent, except being irregularly crested.

LINEARE, *Moore*.—Found in North Lancashire, in 1863, by Mr. R. Preston. Fronds somewhat small, extremely narrow and attenuated. Sori situated near to, and sometimes on the margin of the frond.

MARGINATUM-ACUTUM, *Stansfield*.—Found in North Lancashire. Less than *marginatum*, and acute.

MULTIFIDUM-MAJUS, *Stansfield*.—Found in Craven, Yorkshire; in North Devon; and in Ireland, by various persons. An unusually large normal form of *multifidum*.

OMNILACERUM, *Lowe*. (Fig. 741.)—An elegant Fern raised from spores by Mr. Glave, of Scarborough. Length eighteen to twenty inches. Narrow, upright-growing, and lacerated almost

to the costa, the lacerations soriferous along their margins and dentate at the apex. My thanks are due to Mr. Glave for a plant.



Fig. 741.—Apex.

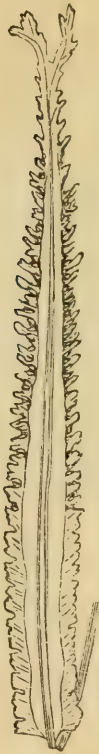


Fig. 742.



Fig. 743.

KRASPEDOUMENON, *Lowe*. (Fig. 742.)—A beautiful dwarf *marginatum*. Length eight inches, width from a quarter to half an inch, with an irregular dentate margin, the dentation variable, some linear, others club-shaped, and others bidentate. Colour a rich green. Widest at the base, and gradually tapering to an attenuated bifurcate apex. Raised from spores by Mr. Elworthy, of Nettlecombe.

SINUM, *Lowe*. (*Pocilliforme*, Padley, MSS.) (Fig. 743.)—An irregularly margined form, undulate, marginate in the

centre of the frond, where denticulate. The costa at the back of the frond terminating within the frond itself in a conspicuous cup or pocket. Length eight inches, width one inch and three quarters. Length of the pocket one inch and a half, width nearly an inch, the margin being crisped. Found by Mr. Moly, of Hawkchurch, Dorsetshire. I am indebted to the Rev. C. Padley for fronds.

MULTIFIDUM-RESECTUM, *Stansfield*.—Raised from spores in 1862 by Messrs. Stansfield, of Todmorden. Like *multifidum*, but wanting the broad lobes. Resected.

SUPRALINEATO-ANGUSTUM, *Stansfield*.—Found in North Devon by Mr. Lewis, of Ilfracombe. A medium-sized, supralineated form, with extremely narrow somewhat lacerated fronds.

SUPRALINEATO-UNDOSUM, *Stansfield*.—Found in North Devon by Mr. J. Dadds, of Ilfracombe. Resembling *supralineato angustum*, but having undulated fronds.

PSEUDO-COOLINGII, *Lowe*.—Raised from bulbils on the fronds of *Coolingii* in the same manner as *pseudo-Wardii* was raised from *Wardii*, differing from *pseudo-Wardii* in having undulate fronds. I am indebted to Mr. Edwin Cooling, of Mile Ash Nursery, Derby, for a plant.

CHELÆFRONS, *Wollaston*.—Found at Chiselhurst by Mr. Wollaston. Fronds very dwarf, from half an inch to four inches long, rarely more than two inches. Base subcordate, apex furcate in the shape of a crab's claw. Lobes curving and overlapping. External margin smooth, internal dentate or crenate.

ANGUSTUM, *Moore*.—A simple form, narrowing much to the base, and acute at the apex. Length eight inches, width three eighths of an inch at the base, and one inch in the broadest part. Sori narrow, regular, and extending from the base to the apex. I am indebted to Messrs. Stansfield for fronds. Found in County Clare in 1863, by Mr. A. Stansfield.

HASTULATUM-MAJUS, *Moore*.—Length fifteen inches, width at the base, where widest, three inches. Hastulate; costa flexuous; margin slightly lobate; thick-fronded and copiously soriferous; apex pointed.



Fig. 744.

COOLINGII, *Lowe*. (Fig. 744.)—A very handsome dwarf variety, soon to be distributed by Mr. Edwin Cooling, of Derby. Its history is obscure, but the stock of this form has been purchased by Mr. Cooling, to whom I am indebted for a plant and fronds. Its nearest ally is *Wardii*, from which it differs in being wider spread and in the margins being only lobate. The stipes branches near the base, and the stems again branch within an inch of the base, and the lamina re-branches several times; the branches wavy and digitate, their numerous apices dilate, not crested, forming a perfect ball-like plant, and each frond also ball-like. Erect-growing, height from two to three inches, width across the fronds three inches. The fronds, like *Wardii*, are proliferous.

CORYMBIFERUM-MAJUS, *Ivery*.—A dwarf form in which half the frond is occupied by the irregular formed, very leafy, scarcely cut, multifid corymbiferous head. Length five inches, width across the head three inches.

SUBMARGINATO-DENTATUM, *Moore*.—Raised from spores by Messrs. Stansfield, of Todmorden. Length three to six inches, width one inch to one inch and a half. Base cordate, margin sinuous and crenately-toothed, apex furcate or abrupt, frond variable.

IRREGULARE-LACINIATUM, *Lowe*.—Length eight inches, width two inches at the base, where it is widest, narrowing to an inch at the apex, which is flat and much cut. Upper half of frond much laciniated quite to the costa, depauperate, coriaceous, and deep green. Irregular-fronded. Found by Mr. Elworthy.

RIGIDUM, *Wollaston*.—Found at Littlehampton by Mr. Wollaston. Stipites rigid and wire-like, costa stout. Length twelve inches, width two inches and a half. Base cordate, apex multifid with crispy segments, margins parallel and obscurely crenate or dentate. Sub-supralineate.

INCISO-LOBATUM, *Wollaston*.—Found in North Devonshire, in 1861, by Mr. Dadds. Normal in size, being both incised and lobed.

CAPITATUM, *Lowe*.—Found near Littleham, in Devonshire, by the Rev. C. Padley, of Beaconfield, Plymouth. A large-growing form, with a crimped margin, becoming flat near the rachis. The base lobate on one side only. The apex much branched, forming a compact multifid head. The illustration is from the Rev. C. Padley.

KALON, *Lowe*.—Found in North Wales by Mr. Clift, of Balsall Heath, near Birmingham. One of the *submarginatum* group, irregularly narrowed, and having on the upper surface curious ridgy excrescences. The apex bifurcate. The fructification is mostly suprasporiferous. The plant is now in my possession.

MINUS, *Moore*.—A frilled form with a multifid frilled apex. Length fifteen inches.

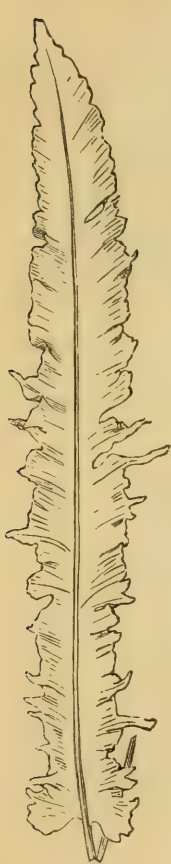


Fig. 745.



Fig. 746.



Fig. 747.

SAGITTATO-PROJECTUM, *Moore*. (Fig. 745.)—Found in County Clare by Mr. Stansfield, and in North Wales by Mr. T. Staley. Length thirteen inches, width one inch and a half to two inches and a half. Somewhat undulate. Base sagittate, apex abruptly pointed. Beyond the outline of the frond are irregular, narrow, lacerated, sharp-pointed projections, some half an inch long, and of the same width at their base and apex.

MARGINATO-PAPILLOSUM, *Moore*. (Fig. 746.)—Erect. Length six to nine inches, breadth half an inch to three quarters of an inch, margined below. On the upper surface a double row of projecting fleshy points extends on either side the midrib.

PADLEYENSE, *Lowe*. (Fig. 747.)—Length two feet, width four inches; undulate. A very broad large form, normal on one side the costa, interrupted on the other; on this side for two inches the lamina is absent, then for two inches half an inch wide, and here the veins are both branched and areolate, and the margin serrate; above this of the normal width for a couple of inches, then again contracted as before for two inches, and then normal to the abrupt pointed apex. Sori narrow and confined to near the apex of the frond. Where uncontracted the margin of the frond is entire. Stipes six inches long. In the possession of the Rev. C. Padley, of Beaconfield, Plymouth.

BIMARGINATO-CORDATUM, *Moore*.—Raised from spores by Mr. Elworthy, of Nettlecombe. A handsome constant form, of somewhat dwarf habit. Fronds broader than *bimarginatum*, a variety which it resembles in structure, but it produces a pair of broad, equal, cordate basal lobes. My thanks are due to Mr. Elworthy, of Nettlecombe; Mr. Clapham, of Scarborough; and Mr. Monkman, of Malton, for plants.

LOBATUM, *Deakin*.—Found in Devonshire by Mr. W. Edwards, of Nuthall, Nottinghamshire. Narrow and lobate, and much cut. The base truncate, and the apex abrupt. The illustration is from a plant presented to me by Mr. Edwards.

SUPRALINEATO-TURGIDUM, *Moore*.—Found in North Devon by Mr. R. Moule, in 1861. Length ten inches, width exceeding one inch and a half, deeply supralineate. Soriferous near the apex of the frond. Spore-cases small and near the margin. Differing from *supralineatum* in having turgid fronds. A dwarf form.

ANGUSTISSIMUM, *Moore*.—Found by Mr. Hewitson in 1863, in North Lancashire. Of medium size, with very narrow fronds, which are somewhat reflexed on the edge.

SUPRASORIFERO-DICHOTOMUM, *Moore*.—Raised from spores by Messrs. Stansfield, of Todmorden, in 1862. Dwarf, twin-stemmed, slightly undulated, costa branching and re-branching dichotomously. Suprasoriferous. Fronds narrow.



Fig. 748.—Apex.



Fig. 749.—Apex.

CRISTATUM-MONKMANII, *Monkman*. (Fig. 748).—Length eighteen inches, normal in form, except two inches below the apex, where lacerately contracted, the apex terminating in a compact leafy crest. Copiously and conspicuously soriferous from the base to the apex.

CRISPUM-CRISTATUM, *Lowe*. (Fig. 749).—Found in Devonshire by the Rev. Charles Padley, of Beaconfield, Plymouth. This Fern differs from the normal form of *crispum* in being crested at the apex. It is normal in size, but rather darker in the green colour of the fronds. Sterile.

CHEIROPHORUM, *Stansfield*.—Found in 1863 in County Clare by Mr. A. Stansfield. Of medium size, broad fronds terminating in a branched head in the way of a hand spread out.

FISSIDENS, *Wollaston*.—Found in North Devon. Fronds deeply cut, and narrower than *fissum*.

CRISPUM-FERTILE, *Stansfield*.—Found in 1863 at Grange, in North Lancashire, by Mr. E. G. Wrigley. Length twenty-four inches, width one inch at the base, and two inches in the centre of the frond. A uniformly well-crisped form, the crispings crenulated, rich green, with a narrow apex, and very copiously and conspicuously soriferous, especially near the apex. My thanks are due to Messrs. Stansfield for a plant and fronds.

POLYCUSPIS-TRANSVERSUM, *Moore*.—Raised from spores in 1862 by Messrs. Stansfield. Differing from *polycuspis* in having the terminal lobes crossing one another, as in *transverso-lobatum*, and in having more numerous points.

LINEARE-CRISTATUM, *Lowe*.—The frond below the multifid apex resembles the same portion of the frond, fig. 674, whilst the apex is not unlike fig. 686. Fronds linear, and having a crested apex.

RAMO-DEPAUPERATUM, *Clapham*.—Raised from spores by Mr. Clapham. Length seven inches, twin-branched at the base, width half an inch, depauperate, each terminating in a compact densely-crested head three inches across.

CRISPUM-MULTIFIDUM, *Lowe*.—Length thirteen inches, width one inch and three quarters. Found in Devonshire by Miss Kitson. Fronds very much crisped, and narrowish at the base. The apex terminating in a compact, leafy, crisped head, three inches across. Differing from *crispum* in being multifid.

CONJUNCTUM, *Moore*.—Found in Guernsey by Mr. James. Fronds eight inches long, one inch and a half broad near the base. Dividing in middle of the frond, and these forked, with multifid apices; margins undulate; apical lobes twisted.

CRENATO-CRISPUM, *Monkman*.—Found at Kirkham, near Malton, by Mr. C. Monkman. A large form, with fronds twelve inches long and two inches broad. Deeply divided into roundish lobes, the margin of the frond crisped, so that the lobes overlap. Fertile and distinct.



Fig. 750.



Fig. 751.

POLYDACTYLUM, *Stansfield*. (Fig. 750.)—Raised from spores in 1862, by Messrs. Stansfield, of Todmorden. Dwarf and narrow. Length six inches, width scarcely exceeding half an inch, strap-shaped, thin, the costa multifid, forming a much-cut apex, (scarcely wider than the outline of the frond) of finger-like points.

POLYSCHIZOMENON, *Lowe*. (Fig. 751.)—Raised from spores by Mr. Elworthy, of Nettlecombe. Length twelve inches, normal

in the lower half of the frond, the costa branching in the centre, and again dividing into two or three lobes, the outer lobes more or less normal or irregular in outline, whilst the centre ones are deeply cut into bifid lobes, with open sinuses. Everywhere conspicuously and copiously soriferous.

COMPLICATUM, Wollaston.—Found at Chiselhurst, Kent, by Mr. G. B. Wollaston. Length six to twelve inches. Base cordate, apex simple or multifid, with twisted apical lobes. Costa occasionally transversely branched, margin irregularly crenate, undulate and laciniate-dentate. Sori numerous, narrow, and irregular.

DISSIMILE, Wollaston.—Found at Grassington, Wharfedale, Yorkshire, by Mr. A. Clapham. Fronds very unlike, the lamina varying from two to eight inches. Broad, apex cordate, margin irregularly and deeply lobed. Sometimes irregularly contracted, fan-shaped, bireniform, etc. Very proliferous.

ABRUPTUM, Moore.—Found at Littlehampton by Mr. Wollaston, at Ilfracombe by Mr. Dadds, and in Guernsey by Mr. James. Fronds variable in size, from two to twelve inches. Base cordate, somewhat undulate. Apex broad and bluntly rounded, the rachis rarely reaching the apex.

CRISPATUM, Moore.—Found in Guernsey by Mr. James. Frond twelve inches long, and from one inch and a half to two inches and a half broad, base cordate, almost parallel-sided, very much curled, apex acute, abundantly fertile.

CONTORTUM, Moore.—Found at Nettlecombe by Mr. Elworthy. Length six inches. Base cordate, with a branch two inches long on either side, multifid at the apex, with curly segments; margin nearly entire. Fronds six inches across the branches. Sparingly fertile. Singular from branching at right angles and from the contortion of the multifid points.

VERTICULUM, Lowe.—Found near Torquay by Miss Fanny Kitson, and communicated by Mr. Grey. Length twelve inches, slightly crisped, one inch and three quarters wide, eight inches

above the base, the frond terminating abruptly at the full width as if eaten off; here there is a thickening of the costa, and then a portion of a second frond is as it were attached to its apex, singularly depauperate on one side, and normal on the other. Apex pointed.



Fig. 752.

GLOVERII, *Stansfield*. (Fig. 752.)—A dwarf much-branched variety, somewhat resembling a diminutive form of *glomeratum*. The stem branching and re-branching, and the leafy portion branching and re-branching several times. Length four inches, and width four inches. The illustration is from Mr. Glover.

DISTORTUM-JAMESII, *Lowe*.—Found in Guernsey by Mr. James. Fronds narrow, breadth half an inch, length eight or ten inches. Some fronds have the outline of gnarled oak leaves, sometimes branched in the middle; apex multifid, costa curving or flexuose, margin irregular, as if bitten off. Lamina interrupted, some grotesquely lobate. Copiously soriferous. This is *distortum* of Moore.

MARGINATO-FURCANS, *Lowe*.—A dwarf marginato-dentate variety, with a pointed furcate apex. Length eight inches.

FLEXUOSO-MULTIFIDUM, *Lowe*.—Found at Plymouth in 1862, by Mr. H. Mapplebeck. Length twelve inches. Costa flexuose, the frond widening from the base upwards, terminating in a compact, close, multifid head, scarcely wider than the general outline of the frond, and giving it a horned appearance.



Fig. 753.



Fig. 754.

SUBCORNUTUM-MARGINATUM, *Ivery*. (Fig. 753.)—A subcornute dwarf form irregular and distorted in outline. Submarginate, with a dentate margin. Length four inches.

CORNUTO-SUPERBUM, *Lowe*. (Fig. 754.)—Raised from spores by Mr. Elworthy, of Nettlecombe. A distinct form. Length six inches, of which five inches is the stem; the lamina oval, having a flattened base, crisped, with a regular dentate margin, the apex circular. The stem very scaly throughout, and the costa projecting from the lamina half an inch below the apex of the frond, and pointing outwards in a curve almost at right angles to the frond. Length of the horn from half an inch to an inch.

PERANGUSTUM, *Lowe*.—Found in Guernsey by Mr. James. Length ten inches, width only a quarter of an inch, except the enlarged normal apex, where three quarters of an inch wide. Finely bidentate on the margins, except above the edges of the enlarged apex.

MICRODON, *Moore*.—Found in Ireland by Dr. Allchin. Length twelve inches, width one inch. Base cordate, undulate, subcrenate, here and there dentate and submarginate. Apex multifid, with twisted lobes. Upper surface near the apex sulcate.



Fig. 755.

MARGINATO-MULTICEPS, *Moore*. (Fig. 755).—A handsome form of *marginatum*, having a wide, much-branched, multifid apex. Length fourteen inches, width one inch, breadth of apex three inches. Copiously soriferous, except where multifid, and there sparingly so. The illustration is from Mr. Monkman.

CURTUM-CRISTATUM, *Lowe*.—Length six inches. Like a large normal frond, suddenly contracted to the costa immediately below a much lacerated crested apex. Found in Devonshire by Mr. Edwards, of Nuthall.

FLOSCULIFERUM, *Lowe*.—Found in Devonshire by Mr. W. Edwards, of Nuthall. Length eighteen inches. The lower half normal, in the centre of the frond split nearly to the costa on

either side, with a wide open sinus, above this again normal. Five inches below the apex the costa becomes branched, and the apices of the divisions furcate. One lobe in each frond is circinate, wrapping round and round, and resembling a partially opening rose-bud. I am indebted to Mr. Edwards for a plant.



Fig. 756.



Fig. 757.

TRUNCATUM, *Ivery*. (Fig. 756.)—A truncate somewhat undulate form, with fronds seven inches long, and above three inches broad. Soriferous along the flat apex.

CRENATO-CRISTATUM, *Lowe*. (Fig. 757.)—A form of *crenatum*, with the stipes branching two inches below the apex, and each branch being crested. Length fifteen inches, width one inch and a half, and two inches and a half across the head. The illustration is from Mr. Monkman.

LACERUM, *Sim*.—Raised from spores by Mr. R. Sim, of Foot's Cray. Branching like *digitatum*, flabellately multifid,

divisions much narrower, and often again split into shreds, the irregularly-jagged edges of the segments marginate. Viviparous.

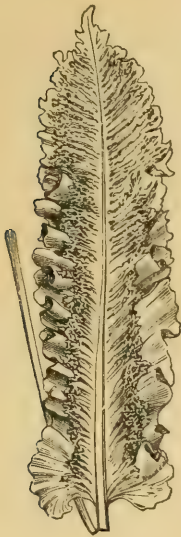


Fig. 758.



Fig. 759.

PLICATUM, *Clapham*. (Fig. 758.)—Raised from spores of *flavo-tinctum* by Mr. A. Clapham, of Scarborough. Beautifully plicate and muricate. Length nine inches, width one inch and a half. Crisped on the margin and muricated in the middle of the fronds on either side the costa. Apex acuminate.

SUPRALINEATO-CRISPUM, *Lowe*. (Fig. 759.)—A dwarf form. Fronds four inches in length, of which one half is the stipites. Outline irregular, and the margin minutely dentate, supralineate in an irregular line, close to and on either side of the costa, the fronds somewhat crisped.

MARGINATO-CONVEXUM, *Lowe*.—Length fourteen inches. Interruptedly marginate, the margin irregularly lacerated, contracted for an inch in length in the centre of the frond, and more regularly lacerated above, forming prominent lobes, with a bidentate segment at the base of the sinuses. Remarkable

for the upper half of the frond being considerably convex above and concave beneath. Raised from spores by Mr. Elworthy, of Nettlecombe.

AURATUM, *Lowe*.—Fronds of two kinds. Length of the first usually six inches, naked, except the large aurate lobes above three inches in length, closely resembling elephants' ears. Margin smooth, coriaceous, undulate, and deep green. Dispersed with these are large undulate fronds, somewhat ramose and here and there depauperate. Found in Devonshire by Mr. Edwards, of Nuthall.

RAMOSO-CONTRACTUM, *Moore*.—Found by Mr. Jackson. A dwarf ramose form of *contractum*, similarly cristate and contracted.

JACKSONII, *Moore*.—Found at Bideford, Devon, by the late Mr. C. Jackson. Length six or eight inches, irregularly contracted, but with unequal prominent lobes, like *sinuatum*, contractions crenate. Base subtruncate, apex irregularly branched, the branches with irregular margins, and terminating in a dense globular-cristate tassel.

FISSO-MULTIFIDUM, *Lowe*.—Length twelve inches. An interesting form of *fissum*, with an attenuated apex, terminating in a small multifid head.

VIVO-MARGINATUM, *Clapham*.—Fronds two to four inches, very narrow, margin entire or distantly dentate, often marginate, the apex multifid, segments dentate, sometimes with a scarcely margined costa. Raised from spores by Mr. Clapham, of Scarborough, and myself.

CRISPUM-DENSUM, *Sim*.—A dwarf, broad, densely-crisped form, with a much lacerated apex.

LONCHOPHORUM, *Moore*. (Fig. 760.)—Found in North Lancashire, in 1862, by Mr. R. Preston. A narrow strap-shaped form, eight or nine inches long, and a quarter to three eighths of an inch wide. Base cordate-lanceolate on the margin.

Sori narrow, crowded, and soon confluent, running quite up to or on the margin, and even forming a marginal suprasoriferous line. Apex trifid or bifid. Dark green.



Fig. 760.

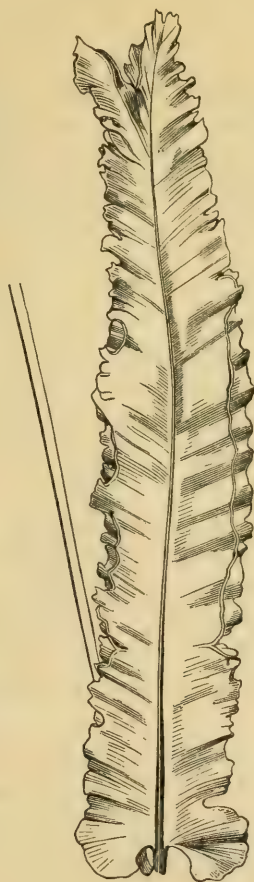


Fig. 761.



Fig. 762.

MARGINATO-BIFORME, *Monkman*. (Fig. 761.)—A compound form, having coriaceous fronds of normal size, but frequently submarginate, or supralineate. My thanks are due to Mr. Monkman for fronds.

PINNATIFIDUM, *Moore*. (Fig. 762.)—Raised from spores by Mr. Elworthy. Length ten inches, width three quarters of an

inch. Narrow at the base, gradually widening upwards, widest at the apex, where rounded, pinnatifid with deep open sinuses, irregular in size and form. Mr. Clift, of Balsall Heath, has raised a large form of this, seventeen inches in length and one inch wide.

POLYMORPHUM, *Wollaston*.—Found in Sussex in 1854, by Mr. Wollaston. Fronds very polymorphous and very broad. Some like *crenato-lobatum*, with a large lateral branch; others like *abruptum*, with an arrested branch; some with a separated basal lobe; others abbreviated, normal, multifid, ramose, or truncate.

CRISPUM-MINUS, *Jackson*.—Found in Guernsey by the late Mr. Jackson. Small, much curled. Fronds ten inches long, and one inch and a half broad. Base cordate and toothed, apex acute or sometimes multifid. Margins frilled, dentate, and nearly parallel-sided.

DETECTUM-JAMESII, *Lowe*.—Found in Guernsey by Mr. James, of Vauvert. Fronds somewhat narrow, the margin crenate, the base truncately-cordate, the apex multifid, with flat, spreading, many-pointed segments. Sori small and naked, indusia imperfect, almost wanting. Fronds nine inches in length, exceedingly coriaceous, the venation obscure.

CRISPUM-VARIANS, *Moore*.—Found near Settle by Mr. A. Clapham. Broad and variable, sometimes crisped, and with a simple acute apex, sometimes truncate, sometimes multifid or ramose, and frilled; others very irregular and more undulate. Proliferous.

COMPOSITUM, *Moore*.—Fronds twelve inches long, Base sagittately-lobed; lower half and extreme apex crisped, upper portion marginate, with lacinate teeth. A singular composite form.

FLABELLATUM-CORNUTUM, *Lowe*.—Length of frond eleven inches, of which the basal three inches is the stipes. Narrow. Five inches below the apex the midrib dividing in a forked

manner, into two much-branched, very leafy heads, five inches in width, contracted above the forking, and between the forks cornute.



Fig. 763.



Fig. 764.

PAPILLOSO-IRREGULARE, Monkman. (Fig. 763.)—This form also producing the series of wart-like excrescences on the upper surface. The fronds lobate at the base, then depauperate to the centre of the frond, the leafy portion all but wanting. General outline of the upper surface almost normal and slightly undulate, papillose and muricated. Width one inch and a quarter in the upper half, and only a quarter of an inch in the basal half. Length fourteen inches. The illustration is from Mr. Monkman.

CORRUGATO-CRISTATUM, Ivery. (Fig. 764.)—A dwarf form with a multifid-crested apex. Sori copious. Corrugated. Length

six inches. I am indebted to Messrs. Ivery, of Dorking, for fronds



Fig. 765.



Fig. 766.



Fig. 767.

SCALPTURATO-LATUM, *Moore*. (Fig. 765.)—A form of *scalpturatum*, wider, and undulate, muricate, and multifid at the apex.

ADUNCUM, *Moore*. (Fig. 766.)—Fronds crooked. Length ten inches, width three quarters of an inch to one inch. Outline irregular, conspicuously lobate, the sori narrow and continued to the base of each lobe. Apex bifurcate.

CORRUGATO-FISSUM, *Stansfield*. (Fig. 767.)—Upright. Length twelve to eighteen inches, width nearly an inch. Marginate below, channeled and corrugated in cross lines above; margin deeply cut, giving a pinnatifid appearance.

SUPRALINEATO-LATUM, *Moore*.—Length fourteen inches, width in centre, where widest, three inches and a half. Interruptedly supralineate on the margin, where irregularly lobate and dentate. Apex pointed. A broad handsome frond, copiously soriferous. Found by Mr. Elworthy.



Fig. 768.

MALCOMSONIÆ, *Stansfield*. (Fig. 768.)—Found at Clonmel by Miss Malcomson. A handsome form, the lamina branching at the base; otherwise almost normal, copiously soriferous. Two inches below the apex branching into a large nearly circular head, and near the apex of each tip narrowing, and then expanding into a large dense hand-like head, with narrow lacerations. Length thirteen inches, width across each multifid head three to four inches. The illustration is from Messrs. Stansfield.

MARGINATO-CORRUGATUM, *Moore*.—Upright, narrow, fleshy, margined beneath, the upper surface laterally divided into deeply corrugated lines.

TORTUM, *Moore*.—Found in Guernsey by Mr. James. Length eight inches, breadth one inch and a half, slightly broadest in the middle. Base cordate, apex multifid, crisped. Margins finely undulated with minute, twisted, projecting, pointed lobes.



Fig. 769.

LATO-DIGITATUM, *Stansfield*. (Fig. 769.)—Raised from spores in 1862, by Messrs. Stansfield, of Todmorden. Length eight inches, width one inch and three quarters, normal below, the costa branching four inches from the base into a wide digitate head nearly six inches broad, solid and leafy, with an irregularly not much cut apical margin. The illustration is from Messrs. Stansfield.

DAREOIDES, *Wollaston*. (See page 296.)—A very good form. Much depauperated, little more than the costa, and conspicuous, distant teeth remaining, except a more leafy portion on one

side of the apex; copiously soriferous at the base of the teeth and at the apex. I am indebted to Mr. G. B. Wollaston for the illustration.



Fig. 770.



Fig. 771.

Cervi-cornu, *Moore*. (Fig. 770.)—A distinct form, seven inches long, and half an inch wide, branching in the middle, and re-branching several times like stags' horns. A membrane runs midway from the margin and costa, along which the small oval spore-cases are situated. Exterior to this line crenate-lobate, the margins being minutely and densely denticulate. Width across the apex four inches. The illustration is from Messrs. Stansfield.

Marginato-coronatum, *Moore*. (Fig. 771.)—Resembling *marginatum*, and in addition having the margin of the frond cut into small rounded lobes in the same manner as in *macro-sorum*, and the apex developed into a spreading curly head of pointed segments, resembling a coronet.

ALBESCENS, *Moore*.—Dwarfish, somewhat narrow, almost *white* above, and *deep green* beneath. A distinct form in Messrs. Stansfield's collection.



Fig. 772.

CONGREGATUM, *Lowe*. (Fig. 772.)—A large-growing multifid variety. The stem twin-branched near the base, then naked for three inches, an inch above this branching from the costa on one side and re-branching, the apex expanding into a large, multifid, crisped, narrowly-lacerated, compact, bushy head.

CRISPATUM-VARIANS, *Moore*.—Found in the Isle of Wight by

Mr. R. Bloxam. Length ten inches, breadth one inch and a half, lobate and unequal at the base, margin undulate and dentate, apex dilate. Autumn fronds three inches broad, and with small projecting lacerate lobes. Fertile.



Fig. 773.

CORYMBIFERUM, *Lowe*. (Fig. 773.)—A branched form, remarkable for the smooth rounded manner in which the corymbose heads terminate. Height six inches.

CORRUGATUM, *Wollaston*.—Found by Mr. Hillman near the Devil's Punch Bowl, Hindhead, Surrey. Length fourteen inches, width two inches. Base cordate, apex attenuate, margins corrugate and sinuately-lobed. Fertile.

CRISPUM, *Gray*.—A barren form with elegant frilled fronds of normal size. Found in Guernsey by Mr. James, Barnstaple by Mr. Jackson, Byland Abbey by Mr. Monkman, Furness Abbey by Mr. A. Stansfield. One of the oldest known varieties, the base cordate, and the basal lobes unusually large, and overlap.

CRISPUM-BULBIFERUM, *Stansfield*.—Rather broader than *crispum*, especially below, shining rich green in colour, occasionally slightly fringed on the margin, and is bulbiferous.

DIGITATUM-NANUM, *Stansfield*.—A permanently dwarf desirable form of *digitatum*.



Fig. 774.



Fig. 775.

COLUMNARE, *Clapham MSS.* (Fig. 774).—Raised from spores by Mr. A. Clapham, of Scarborough. Slender, six to eight inches long, and not a quarter of an inch wide; linear and irregularly and remotely lobate-dentate; apex branching, the margins of the ramifications also dentate. I am indebted to Mr. Clapham for fronds.

KERATOIDES, *Lowe.* (*Acrocladon*, Clapham.) (Fig. 775).—One of the most interesting varieties yet in cultivation. Length nine inches, width from an eighth to a quarter of an inch, irregularly lacerate, and with the sori marginal. The stipes branching three inches above the base, and then re-branching two or three times, all the parts of the frond being narrow and irregularly lacerate; width across the multifid apex four inches, the divisions being narrow, irregular, and very stag's-horn like, hence the name. Raised from spores by Mr. Clapham, of Scarborough.



Fig. 776.

POLYCUSPIS-UNDOSUM, *Moore*. (Fig. 776.)—Described at page 308.



Fig. 777.

POLYCUSPIS-ANGUSTUM, *Moore*. (Fig. 777.)—A very interesting form of *polycuspis*, with narrow irregular-margined fronds, and a much-branched apex having lacerate tips.

MUCRONATUM, *Willdenow*.—A sterile form raised by Mr. Clapham. Dwarf, base subcordate, apex blunt, margin undulate and denticulate, and costa cornute.

SCALPTURATO-LOBATUM, *Moore*.—Found at Nettlecombe by Mr. Elworthy, and at Exeter by Mr. R. J. Gray. A *scalpturatum* multifidly lobed.

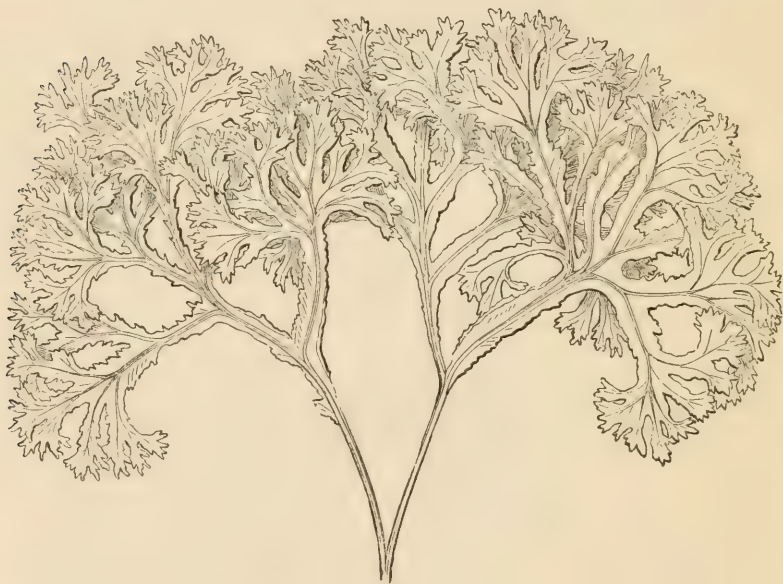


Fig. 778.

RAMO-MARGINATUM, *Clapham*. (Fig. 778.)—True form. See Plate LI. This magnificent variety, for which we are indebted to Mr. A. Clapham, of Ramsdale Bank, Scarborough, has been described on page 245. It has so much improved in its ramose character in the last two seasons, that it has been thought desirable to give an additional figure of a frond, though it has been found necessary to give the illustration on a much reduced scale.

The following varieties I have been unable to procure and therefore they will be deferred to a supplement.

- | | |
|---|--|
| Bisagittatum, <i>Moore</i> . | Pygmæum, of Mr. P. N. Fraser's Catalogue. |
| Chelæfrons-majus, <i>Wollaston</i> . | Pallescens, <i>Moore</i> . |
| Confertum, <i>Sim</i> . | Phyllochlæna, <i>Moore</i> . |
| Denticulatum, <i>Moore</i> . | Polycuspis-irregulare, <i>Moore</i> . |
| Discolor, <i>Wollaston</i> . | Projecto-multifidum, <i>Moore</i> . |
| Drummondia, <i>Moore</i> . | Ramosum-minus, of Mr. P. N. Fraser's Catalogue. |
| Hilmanii, <i>Williams</i> . | Ramosum-Wollastonii, of Mr. P. N. Fraser's Catalogue. |
| Imbossum, <i>Moore</i> . | Sagittato-Hillmanii, <i>Lowe</i> . |
| Infralineatum, <i>Williams</i> . | Sagittato-multifidum, of Mr. Ivery's Catalogue. |
| Iveryanum, <i>Ivery</i> . | Sagittato-cristatum, <i>Wollaston</i> , (not <i>Clapham</i> .) |
| Laceratum-elegans, <i>Moore</i> . | Scalpturato-latum, <i>Moore</i> . |
| Laciniatum-Wollastonii, of Mr. Ivery's Catalogue. | Serratifolium, of Mr. Ivery's Catalogue. |
| Longipes, <i>Moore</i> . | Submarginato-certosum, <i>Clapham</i> . |
| Maculosum, <i>Moore</i> . | Supralineato-fimbriatum, <i>Moore</i> . |
| Maineanum, <i>Moore</i> . | Sinuato-variegatum, of Mr. P. N. Fraser's Catalogue. |
| Marginatum-abruptum, of Messrs. Stansfield's Catalogue. | Staley, of Mr. P. N. Fraser's Catalogue. |
| Multifidum-crispum. | Subconfluens, of Mr. P. N. Fraser's Catalogue. |
| Naviculæforme, <i>Wollaston</i> . | Submarginatum-projectum, of Mr. P. N. Fraser's Catalogue. |
| Officinarum-serratum, of Mr. Ivery's Catalogue. | Trilobatum, of Mr. P. N. Fraser's Catalogue. |
| Pachyphyllum, of Mr. P. N. Fraser's Catalogue. | Weaveri, <i>Moore</i> . |
| Polyschides-cornutum, of Mr. P. N. Fraser's Catalogue. | |
| Polyschides-undosum, of Mr. P. N. Fraser's Catalogue. | |
| Pumilum, of Mr. P. N. Fraser's Catalogue. | |
| Polyphyllum, <i>Wollaston</i> . | |

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GENUS IX.

CETERACH. WILLDENOW.

CAUDEX brief, erect, and tufted.

Fronds pinnatifid, coriaceous, densely scaly beneath, with imbricated chaffy scales. Sori linear oblong, obsoletely indusiate, the receptacles lateral. Veins forked from a central costa.

The character of *Ceterach* is midway between *Asplenium* and *Gymnogramma*.

The late illustrious Sir W. J. Hooker, in "Species Filicum," places this solitary Fern with *Asplenium* in the sub-genus *Hemidictyum*. A host of botanists give the rank of *Ceterach*, whilst others have united it with *Scolopendrium*, *Vittaria*, *Gymnopteris*, *Grammitis*, *Gymnogramme*, *Acrostichum*, *Blechnum*, and *Polypodium*.

Sir W. J. Hooker, in his large genus *Asplenium*, numbering three hundred and five species, divides them into sub-genus 1.—*Thamnopteris*, seven species, *A. Australasicum* being an example; 2.—*Euasplenium*, two hundred and seven species, *A. marinum*, *A. lucidum*, *A. bulbiferum*, *A. trichomanes*, and *A. viviparum* being examples; 3.—*Athyrium*, twenty-nine species, *A. filix-fœmina* and *A. umbrosum* being examples; 4.—*Eudiplazium*, fifty-one species, *A. striatum* being an example; 5.—*Anisogonium*, seven species, *A. esculentum* being an example; and 6.—*Hemidictyum*, four species, *A. marginatum* and *A. ceterach* being examples.

Mr. Thomas Moore, in "Index Filicum," retains the genus *Ceterach*, and does not agree in uniting the Mediterranean form *aureum* with our British *officinarium*, notwithstanding that my namesake, the Rev. R. T. Lowe, has found every variety of form and size uniting the two.

The obscure indusium is so marked a feature that I have followed the latter authority, preferring this to the bolder conception of uniting in one grand family such species as *A. marinum*, *Athyrium filix-fœmina*, *Diplazium striatum*, *Hemidictyum marginatum*, and *Ceterach officinarum*.

Only one British species.





Fig. 779.—Portion of mature Frond, upper side.

CETERACH OFFICINARUM.

WILLDENOW.

The Scaly Spleenwort.

PLATE LVII.

<i>Ceterach officinarum</i> ,	WILLDENOW. HOOKER AND ARNOTT.
“ “	GRAY. BABINGTON. DEAKIN. FEE.
“ “	NEWMAN. BENTHAM. SOWERBY.
“ “	MOORE. LINK. HENFLER. NYMAN.
“ “	METTENIUS. E. J. LOWE. DESVAUX.
“ “	KUNZE. WEBB AND BERTH.
“ “	J. SMITH. PAPPE AND RAWSON.
<i>Ceterach ceterach</i> ,	NEWMAN.
“ <i>latifolium</i> , var.	FEE.
“ <i>Canariensis</i> , “	WILLDENOW.
“ <i>aureum</i> , “	LINK. WEBB.
<i>Acrostichum aureum</i> , “	CAVANILLES.
<i>Grammitis aurea</i> , “	SWARTZ.
<i>Asplenium latifolium</i> , “	BORY.
<i>Notolepium ceterach</i> ,	NEWMAN.
<i>Scolopendrium ceterach</i> ,	SYMONS. SMITH. ROTH.
<i>Vittaria ceterach</i> ,	BERNHARDI.
<i>Gymnopteris ceterach</i> ,	BERNHARDI.
<i>Grammitis ceterach</i> ,	SWARTZ. SCHKUHR. MACKAY.
“ “	HOOKER. KOCH. LODDIGES.
<i>Gymnogramme ceterach</i> ,	SPRENGEL. PRESL. LEDEBOUR.
“ “	SADLER.

<i>Asplenium ceterach</i> ,	LINNÆUS. BOLTON. LIGHTFOOT.
“ “	STURM. CAVANILLES. LAMARCK.
“ “	HOOKE.
“ <i>sinuatum</i> ,	SALISBURY. (Not of POIRET, HOOKER, or METTENIUS.)
<i>Blechnum squamosum</i> ,	STOKES.
<i>Polypodium asplenoides</i> ,	SCOPOLI. SCHKUHR.

Ceterach—A name (*Chetherak*) given by the Arabian and Persian physicians. *Officinarum*—.....?

FRONDS numerous. Length one inch and a half to eight inches, fleshy coriaceous, linear-lanceolate, profoundly pinnatifid, frequently pinnate below, deep green, smooth above, densely tawny-scaly beneath.

Veins forked and indistinct.

Caudex brief, tufted, scaly. Vernation circinate.

Stipes brief, densely tawny-scaly, and venose, with numerous black reticulations.

Sori covering the whole under side of the frond, linear oblong. Indusium obsolete.

A local Fern, growing on walls and ruins from the sea level to an altitude of six hundred feet.

Found in Cornwall, Devonshire, Somersetshire, Hampshire, Dorsetshire, Wiltshire, Sussex, Hertfordshire, Kent, Berkshire, Essex, Surrey, Oxfordshire; Norfolk, Suffolk, Gloucestershire, Warwickshire, Monmouthshire, Herefordshire, Worcestershire, Staffordshire, Shropshire, Nottinghamshire, (Nottingham Park, Colwick, and Papplewick, probably now extinct in this county,) Derbyshire, Cheshire, Lancashire, (I have seen it abundantly in two new localities near Clitheroe, namely, Pendle Hill and Browsholme Hall, always the variety *crenatum*.) Yorkshire, Northumberland, Westmorland, Cumberland, Brecknockshire, Glamorganshire, Carmarthenshire, Pembrokeshire, Denbighshire, Merionethshire, Carnarvonshire, Berwickshire, Dumfriesshire, Kircudbrightshire, Renfrewshire, Lanarkshire, Argyleshire, Perthshire, Antrim, Down, Fermanagh, Sligo, Galway, Louth, Dublin, Wicklow, Kilkenny, Waterford, Tipperary, Clare, Cork, Kerry. Jersey, Isle of Wight, Arran Isles, and Anglesea. Abundant in the west and north-west of England. Ireland, abundant, but local. Rare in Scotland and on the east of England.

Found abroad in Holland, Switzerland, Germany, Belgium, France, Spain, Italy, Portugal, Siberia, Austria, Hungary, Greece, Turkey, Russia, Dalmatia, Croatia, Transylvania, the Balearic Isles, Gothland, Ural Mountains, Caucasus, Armenia, India, Algiers, Madeira, Azores, Canaries, and Cape de Verd Isles, Asia Minor, Erzeroum, Karabagh, Thibet, Brazil, etc.

It is doubtful whether the larger-growing *Ceterach Canariensis* of Willdenow is a distinct species.

The *Ceterach* is said to require a rough porous soil of sandy loam, with fragments of limestone, and kept rather dry. The finest plants I have seen have been left to take care of themselves in a damp situation and a close heavy clayey soil, where the sun never shines, but exposed to the north. Growing wild they are seldom found except on the south or sunny side of a wall.

There are but few varieties of this species that have come under my notice.

CRENATUM, Moore, (*Sinuatum* of Kinahan.)—Found at Arnside Knot, Ambleside, by Miss Beever; Keswick by Miss Wright; Pendle Hill, near Clitheroe, by Mr. Garnett; Browsholme Hall, near Clitheroe, by myself; Crickhowel, Brecknockshire, by Mr. J. R. Cobb; Devonshire by Mr. R. J. Gray; Kinnoul Hill, near Perth, by Mr. T. Wilcke; in Kircudbrightshire by Mr. W. G. Johnstone; Clare by Dr. Allchin; Blackhead and Galway by Mr. R. Barrington; Carberry Island by Major A. S. H. Lowe; and Waterford by Mr. J. R. Kinahan. Mostly larger than the normal form, having the margins of the lobes crenate-sinuate. A form of this Fern, *crenatum-minor*, differs only in being less than the normal form with a crenate margin.

RAMOSUM, Moore.—Found at Ilfracombe by Mr. J. Dadds. Dwarf. Length two inches, the fronds twin at the top of the stipites, the branches resembling small normal fronds, occasionally dilated upwards, the margin scarcely divided.

MINIMUM, Lowe. (Fig. 780.)—Found in Devonshire. A dwarf normal form, its peculiarity consisting in the fronds not exceeding two inches in length.

VARIABLE, *Lowe*. (Fig. 781).—A lax form, with variable pinnae, some uncut, others irregularly crenate and variously shaped. Found at Browsholme Hall, Lancashire. Length five inches.



Fig 780



Fig. 781.

DEPAUPERATUM, *Wollaston*.—Found at Kilkenny by Colonel Buchanan. Fronds variable, some sinuate-pinnatifid irregularly, others with a bifurcate apex, some with an acuminate apex, others cornute. Segments much depauperated or almost wanting, the fronds resembling a sinuately-winged rachis.

KALON, *Lowe*. (Fig. 782).—A handsome form, eight inches long, and one inch and a half wide in the widest part.

Pinnae large, with conspicuous projecting crenate lobes. Pinnae rounded at the apex. This variety approaches nearest to the *Ceterach Canariensis* of Willdenow, (*Asplenium ceterach* var. *aureum* of Hooker.)



Fig. 782.



Figs. 783, 784.

RAMOSO-CRISTATUM, *Lowe*. (Figs. 783 and 784.)—An extra-

ordinary form, originally found in Ireland, and now growing luxuriously on the rockery of Mr. A. Wise, of Woodcote, near Warwick. Fronds branching, multifid at the apex, and now and then crested also. Pinnæ variable in size and form, some pinnatifidly or even pinnately branching. A large-growing variety. The illustrations are from Mr. Wise.

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GENUS X.

LOMARIA. WILLDENOW.

FRONDS simple, pinnatifid or pinnate; the fertile fronds contracted. Sori submarginal or contracted, linear and indusiate, the indusium subintramarginal.

The fertile fronds always contracted.

Moore, Bentham, Swartz, Schkuhr, Mettenius, and others, have considered the British Fern about to be described as a *Blechnum*, and the sori when young closely agrees with *Blechnum*; yet I agree with the late Sir W. J. Hooker, that the habit and dimorphous fronds are so characteristic of *Lomaria*, as to make it imperative to place our "Hard Fern" in the genus *Lomaria*. There is so great an affinity between *Blechnum* and *Lomaria* that Schlechtendal has united the two genera, and his views have been adopted by other able pteridologists.

Sir W. J. Hooker, in his "Species Filicum," enumerates fifty-five species as *Lomaria*, and forty as *Blechnum*.

A large family, but only one species a native of Great Britain.





Fig. 785.—Portion of mature sterile Frond, under side.

LOMARIA SPICANT.

DESVAUX.

The Hard Fern.

PLATES LVIII, LIX, AND LX.

<i>Lomaria spicant</i> ,	DESVAUX. SPRENGEL. LINK. FEE. RUPRECHT.
“ “	PRESL. PAPPE AND RAWSON. NEWMAN. DEAKIN.
“ “	HOOKE. E. J. LOWE. KUNZE. J. SMITH.
“ “	BRACKENRIDGE.
“ <i>crenata</i> ,	PRESL. SPRENGEL. (The variety <i>crenatum</i> .)
“ <i>borealis</i> ,	LINK.
<i>Blechnum spicant</i> ,	SMITH. WITHERING. ROTH. KOCH. FRIES.
“ “	LEDEBOUR. MOORE. NEWMAN. BENTHAM.
“ “	NYMAN. CAVANILLES.
“ <i>boreale</i> ,	SWARTZ. SMITH. GRAY. HOOKE AND ARNOTT.
“ “	MACKAY. BABINGTON. SOWERBY SCHUHR. STURM.
“ “	WILLDENOW. METTENIUS. SCHLECHTENDAL.
“ <i>heterophyllum</i> ,	OPHIZ. (Not of SCHLECHTENDAL.)
“ <i>spicans</i> ,	WOLLASTON.
<i>Osmunda borealis</i> ,	SALISBURY.
“ <i>spicant</i> ,	LINNÆUS. LIGHTFOOT. BOLTON. CURTIS. POIRET.
<i>Onoclea spicant</i> ,	HOFFMANN.
<i>Asplenium spicant</i> ,	BERNHARDI.
<i>Struthiopteris spicant</i> ,	WEIN. SCOPOLI. ALLIONI

<i>Acrostichum spicant</i> ,	VILLARS. SIETHORP. ROTH.
“ <i>nemorale</i> ,	LAMARCK.
<i>Stegania borealis</i> ,	R. BROWN.
<i>Spicanta borealis</i> ,	PRESL.
<i>Acrostichum lineatum</i> ,	CAVANILLES. SWARTZ. DESVAUX. WILLDENOW.
	(Variety <i>crenatum</i> .)

Lomaria—From *loma*, a fringe, relating to the indusium.

Spicant—Spiked.

Two kinds of fronds.—*Sterile* from six to twenty inches long, and one to two inches broad, spreading or flat, coriaceous, deep green, linear-lanceolate, pectinately-pinnatifid, segments linear-oblong and curved, base dilate and confluent, apex blunt or acute, margins entire. *Fertile* erect, length twelve to thirty inches, growing in a mass in the centre of the plant. Pinnate below, segments linear-acute, only half the width of the fertile fronds, distant below, approximate upwards.

Caudex stout, tufted, and with narrow tawny-brown scales. Venation circinate.

Stipes of sterile frond from one to five inches in length, and dark purplish brown. Rachis channeled in front, rounded behind. Stipes of fertile frond from five to ten inches long, and dark purple.

Fertile on the whole under surface. Sori indusiate, linear, and extending on either side the costa the whole length of the segment. Confluent.

One of the commonest of British Ferns, growing from the sea-level to four thousand feet altitude, in rough heathy or stony places, or in shady banks and woods where moist.

Localities too numerous to enumerate. Found throughout Europe, also in Madeira, Canary, Teneriffe, Azores, Cape of Good Hope, Northern Africa, Chili, Australia, Japan, and in North-west America.

A beautiful species, easily cultivated, preferring a north aspect and a moist soil.

There are a number of curious varieties:—

GRACILE, *Lowe*, (*gracilis* of Stansfield.)—Found at Harleywood Slack by Mr. Stansfield. Smaller than the normal form, very slender, the lobes distant and somewhat contracted.



Fig. 786.

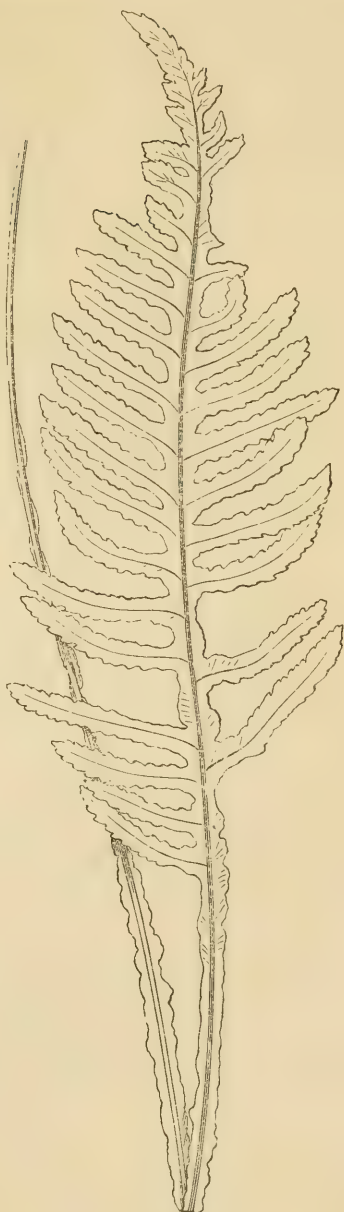


Fig. 787.

STRICTA, *Lowe*, (*strictum* of Francis.) (Fig. 786.)—Found

in Westmorland by Miss Beever; near Black Holme, Windermere, by Mr. F. Clowes; in Ireland by Dr. Allchin; Vale of Todmorden and near Llanrwst by Mr. A. Stansfield; and near Halifax. Sterile fronds lanceolate, more narrowed towards the base than the apex. Length six to nine inches. Segments distant, linear-obtuse, with dilated base, the lower ones rounded. Margins irregularly crenate-dentate, and recurved. Fertile fronds twelve to eighteen inches, with very narrow segments.

PADLEYENSE, *Lowe*. (Fig. 787.)—A remarkable form, found at Exmouth by the Rev. Charles Padley, of Beaconfield, Plymouth. Length twelve inches. The basal seven inches and a half simply winged linearly, being only one eighth of an inch wide, above which suddenly above one inch and a half wide, the pinnæ being attached, as it were, to the exterior of this wing, serrated with a rounded end. The illustration is from the Rev. C. Padley.

BREVILOBA, *Lowe*, (*brevilobum* of Moore.)—Found above Acre Mill, Rosendale, by Mr. Stansfield. Frond three to four inches long, narrow, the lobes only one eighth of an inch in length. The apex confluent into a broad, terminal, obtuse lobe.

ANGUSTIFRONS, *Moore*.—Found in the Vale of Todmorden by Mr. Stansfield. Lax and thinner, widening to an inch in the centre of the frond, and tapering off both to the base and apex. Length ten inches.

FISSA, *Lowe*, (*fissum*, Moore.)—Found near Tunbridge Wells and Todmorden. A large form, having the rachis at the apex split down several inches, both sides bearing lobes, those on the inner side being much the smallest. The apices sometimes multifid.

CRISPUM-ERECTUM. *Ivery*.—A handsome, dwarf, much-imbricated erect form, received from Messrs. Ivery, of Dorking. Length three inches. Narrowing to the base.

CRISPA, *Lowe*, (*crispum* of Wollaston.)—Found in Broadwater

Forest, Tunbridge Wells, by Mr. G. B. Wollaston. Sterile fronds eight to ten inches long, lateral segments crowded, obtuse-pointed, and curled on the margin. The apices of the fronds multifid crisped, forming a small tassell. Fertile fronds similar, and the ends of the narrow lateral segments obtuse.

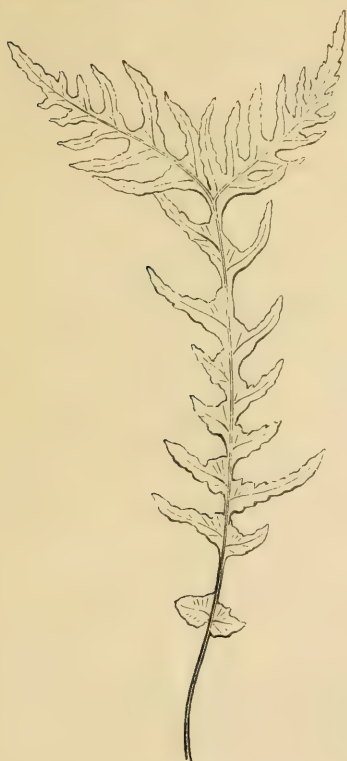


Fig. 788.



Fig. 789.

FURCANS, *Monkman*. (Fig. 788.)—Dwarf; pinnæ distant and dissimilar in size, and near the apex furcate with caudate apices. The illustration is from Mr Monkman.

ANOMALA, *Lowe*, (*anomalum* of Moore.) (Fig. 789.)—Found at Walsden, Lancashire, by Mr. A. Stansfield; Peck Hill by Mr. R. Morris; near Loch Alsh, Ross-shire, by Miss Mahy; and Birker Force, Cumberland, by Mr. F. Clowes. Thin texture, habit lax. Length six to twelve inches. Arching,

segments narrow and subfalcate. Sometimes the upper pinnules are alone fertile, in others sori are produced here and there without any distinction between barren and fertile fronds.

ANOMALA-MINUS, *Lowe*, (*anomalum-minus* of Moore.)—Found at Beddgelart, Carnarvonshire, by Mr. F. C. Wilson, and on Walsden Moor by Mr. Stansfield. A small form of *anomala*, only four inches in height. As it is merely *anomala* in a dwarf state, no illustration is necessary.

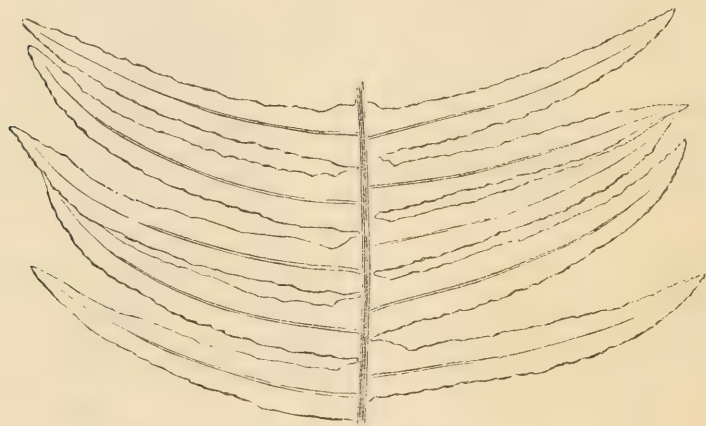


Fig. 790.—Portion of frond.

GIGANTEA, *Lowe*. (Fig. 790.)—A very large form, found at Totness, Devonshire, in 1865, by Mr. W. Edwards, of Nuthall. Length sixteen inches, width three inches and a half. This gigantic form, with long narrow-pointed attenuate crowded pinnæ, might be easily mistaken for the *Lomaria Australis*. The illustration is from Mr. Edwards.

CONCINNA, *Lowe*, (*concinnum* of Moore.)—Found in the Valley of Conway by Mr. Holmes and Mr. Stansfield, Marwood by the Rev. F. Mules, and Barnstaple by the late Mr. C. Jackson. Length six to nine inches, lower portion linear, with rounded dentate segments, above unequal in length, some segments obtuse, some acute, here and there interrupted by short rounded lobes. Fertile fronds very much depauperated.





Fig. 791.—Middle portion of Frond.

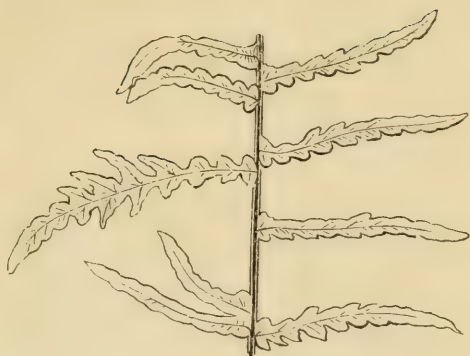


Fig. 792.—Middle portion of Frond.

SUBSERRATA, *Lowe*, (*subserratum*, Moore.) (Plate LIX.—A., and Figs. 791 and 792.)—Found near Castle Howard by Mr. C. Monkman, and near Todmorden by Mr. Stansfield. Fronds narrowish. Length six to twelve inches, width three quarters of an inch to one inch and a quarter. The base often scarcely narrowed, the fronds curving laterally, and the acute segments falcately curved, so as to overlie each other; anterior margin entire, posterior margin crenate. Fertile fronds also deorsely-crenate.

RAMOSA, *Lowe*, (*ramosum*, Kinahan.) (Plate LIX.—B.)—Found near Upper Lough Bray, County Wicklow, by the late Dr. Kinahan; between Ashleagh and Eriffe, County Mayo, by Captain Morton Eden; Furness Fells and Windermere by Mr. J. Huddart; and in Carnarvonshire by Mr. Clift. This interesting form has the rachis of both sterile and fertile fronds dividing into dichotomously crowded branches, with curled dense blunt-ended apical tufts.

CRISPA-AURITA, *Lowe*, (*crispum-auritum*, Moore.)—Found in Ireland by the late Dr. Kinahan. Sterile fronds curled, but having no terminal crest. Fertile fronds slightly multifid at the

apices, and the segments aurite at the base, serrate on the margin, and acute or furcate at their tips.

SUBIMBRICATA, *Lowe*.—Found at Nettlecombe, Somersetshire, by Mr. C. Elworthy. Having longer and somewhat less dense fronds.

PARVULA, *Lowe*, (*parvulum*, Moore.)—Found at Barnstaple by the late Mr. C. Jackson, and at Todmorden by Mr. A. Stansfield. Sterile fronds four to six inches long, and not half an inch wide, and much tapered at the base. Segments crowded, imbricated, and small, ovate above and rounded below.

INÆQUALE, *Moore*.—Found near Todmorden by Messrs. Stansfield. Irregular, with acute unequal segments, but having a normal lanceolate outline.

LATIPES, *Moore*.—Found near Todmorden by Mr. Stansfield. Sterile fronds six inches long and one inch and a quarter broad, the segments not decreasing to the base, but even rather longer there.

BREVIFRONS, *Moore*.—Found in the Vale of Todmorden by Mr. Stansfield. Dwarf. Lobes broad. Length five inches, width one inch. Lance-shaped, and with the few lower segments shorter. Not unlike *Lomaria alpina*.

MAJUS, *Moore*.—Found near Nettlecombe, Somersetshire, by Mr. Elworthy. An unusually large form, with segments two inches long, dilate at the base, and tapering towards an acute apex.

EROSA, *Lowe*, (*erosum*, Moore.)—Found in the Vale of Todmorden by Mr. Stansfield. Length three inches. Fronds irregularly lanceolate, segments variously shaped, their margins erose.

RAMO-DEPAUPERATA, *Lowe*, (*ramo-depauperatum*, Stansfield.)—Found in the Clova Mountains by Mr. J. Horsfall. Sterile

fronds linear below, with brief, rounded, dentate segments, interrupted above, the short segments being interspersed with unequally elongated ones having dilated apices. Usually variously forked and branched.



Fig. 793.



Fig. 794.



Fig. 795.

MINIMA-INTERRUPTA, *Lowe*, (*minimum-interruptum*, Clapham.) (Fig. 793.)—Found at Ilkley, in Yorkshire, in 1863, by Mr. Clapham. A small interrupted form. Length six inches; pinnae various in size and form, some abruptly contracted in the centre. The illustration is from Mr. Clapham.

CONFERTA, *Lowe*, (*confertum*, Clapham.) (Fig. 794).—An interesting, dwarf, elegant form, found by Mr. A. Clapham, at Ilkley, in Yorkshire, in 1863. Pinnæ crowded and imbricated, narrow at the base, widening to the centre, and then narrowing to the apex. The pinnæ blunt at their apices, with an abrupt, sharp, thorn-like point.

PROJECTA, *Lowe*, (*projectum*, Moore.) (Fig. 795).—Found near Ben Lawers by Messrs. Stansfield, of Todmorden. Sterile fronds very narrowly linear-lanceolate, the base and apex tapering, being half an inch wide in the centre. Lobes bluntly rounded and contracted, except here and there normal, and therefore projecting beyond the narrow outline.

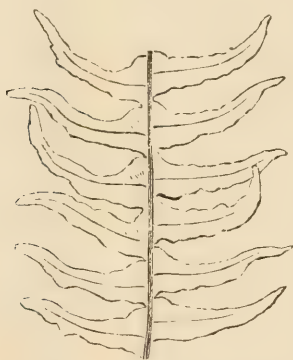


Fig. 796.—Middle portion of Frond.

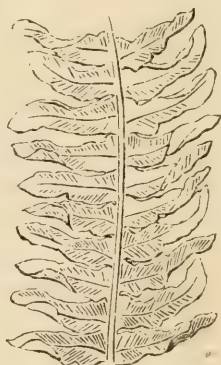


Fig. 797.—Middle portion of Frond.

RETUSA, *Lowe*, (*retusum*, Clapham.) (Fig. 796).—An interesting Fern. Length seven inches, width in the centre one inch and a quarter. Pinnæ retuse and curving. Found by Mr. A. Clapham, of Scarborough, at Ilkley, Yorkshire, in 1863.

CRISPATO-IMBRICATA, *Lowe*, (*crispato-imbricatum*, Stansfield.) (Fig. 797).—Length eight inches. An imbricated crispate form, with flexuose pinnæ.

INTERRUPTA, *Lowe*, (*interruptum*, Wollaston.)—Found near Tunbridge Wells by Mr. Wollaston, and at Castle Howard by Mr. C. Monkman. Variable. Some fronds multifid, or near

the apex irregularly branched, others with depauperate segments, some unilateral near the apex, with the rachis bent hook-like; others furcate, or semi-fertile, and all the fronds interrupted.



Fig. 798.—Middle portion of Frond.



Fig. 799.—Apex of Frond.

SERRATA, *Lowe*, (*serratum*, Wollaston.) (Fig. 798.)—Found near Tunbridge Wells and Ottery St. Mary by Mr. G. B. Wollaston; Barnstaple by the late Mr. C. Jackson; Tanfield Dean, in Durham, by Mr. T. Wilcke; and at Todmorden by Mr. Fielden. Sterile fronds twelve inches long, deeply serrated, tips often furcate. Fertile fronds longer, broadly lanceolate, being three inches wide in the centre; the lobes sharply serrated, and occasionally forked at the tips. The fronds sometimes furcate.

KITSONIÆ, *Lowe*. (Fig. 799.)—A dwarf form. Length five inches; pinnæ crimped, diminutive at the base of the frond, depauperate and irregular, widest near the apex. Pinnæ bending in all directions, and very thin and transparent on their margins. Found at Spitchwick, Ashburton, by Miss Kitson.

TRIDACTYLA, *Lowe*, (*tridactylum*, Moore.)—Found in Towerclough, near Portsmouth, by Mr. S. Nowell. Fronds coriaceous,

three or four inches long, nearly normal, except at the apex, where three much larger segments are developed, often resembling three spreading fingers.



Fig 800.

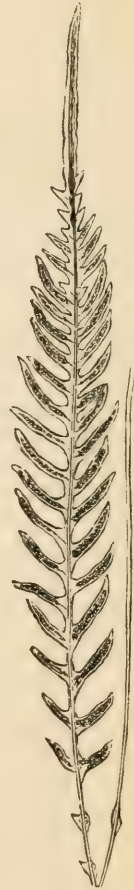


Fig. 801.

RAMO-CRISTATA, *Lowe*, (*ramo-cristatum*, Monkman.) (Fig. 800.)—Found in Yorkshire by Mr. C. Monkman. Twin branched, with a branching crested apex; pinnae short and broad with almost square apices. Length five inches.

LANCIFOLIA, *Lowe*, (*lancifolium*, Wollaston.) (Fig. 801.)—

Found near Tunbridge Wells, in 1853, by Mr. G. B. Wollaston; more recently on the Clova Mountains, in Forfarshire, and near Llanrwst and Todmorden, by Mr. Stansfield. Sterile fronds very narrow and linear, entire and strap-shaped from the apex downwards for nearly half their length, below having short, blunt, unequal lobes. Length five to eight inches, width one eighth to half an inch. Fertile fronds resembling the sterile ones, the upper portion entire and spike-like, and only one eighth of an inch wide. Sori continuous in a longitudinal line close to the rachis.



Fig. 802.



Fig. 803.

CRISTATA, *Lowe*, (*cristatum*, Wollaston.) (Fig. 802.)—Found near Tunbridge Wells, by Mr. G. B. Wollaston; on the Clova Mountains, also in a ravine of Saddleback, Keswick, in 1866, by Mr. A. Clapham. Sterile fronds six or eight inches long, fertile fronds twelve inches. Fronds normal and lanceolate, except that the apex is variable. Sometimes divided and dilated, with broader lobes dilated at the apex. Fertile fronds, the segments

mostly forked. Sometimes the apex of the frond is branched into a large multifid head. Sometimes ramose and interrupted. The frond often sends up sharply-serrated semi-fertile fronds.

MULTIFURCATA, Lowe, (*multifurcatum*, Moore.) (Fig. 803).—Found near Penryn, Cornwall, by Mr. F. Symons; and near Over Darwen, Lancashire, by Mr. Stansfield. Very irregular in form. The fronds branch once or twice, occasionally near the base, the apices of the fronds many times forked, forming a moderate-sized flat tuft. The apical segments are irregular in form and size, they are spread out and extended into an acute point, with irregularly notched margins. Length six to eight inches, tapering below and occasionally having a pair of lateral branches as in *trinervia*; segments frequently unequal in length.



Fig. 804.



Fig. 805.

ELEGANS, Moore. (Fig. 804).—Found in Scotland, by Mr. A. Tait. Length six inches. Pinnæ lobate, being divided to the costa in the upper half of the frond, and scarcely divided and narrowing in the lower half.



BICEPS, Mules. (Fig. 805.)—Found near Marwood, by the Rev. F. Mules. Length nine inches; pinnae widening to the apex, and then branching into two smaller caudate-ended fronds. Width two inches and a half immediately below the branching part.

HETEROPHYLLA, Lowe, (*heterophyllum*, Wollaston.) (Plate LX—A.)—Found near Tunbridge Wells by Mr. Wollaston, Todmorden by Mr. T. Stansfield, and Ilfracombe by Mr. J. Dadds. Bearing two kinds of sterile fronds either separately or together; part normal, and part altered in size and form, the segments becoming narrowed and inciso-dentate, or contracted to a semicircular form, occurring irregularly. Sometimes the fronds are linear, at others irregularly linear. The fertile fronds have the same characters.

IMBRICATA, Lowe, (*imbricatum*, Moore.) (Plate LX—B.)—Found at Parracombe and Culborne, Devonshire, by Mr. J. Dadds; Barnstaple by the late Mr. C. Jackson; Walsden, near Todmorden, by Mr. J. Horsfall; Staups Valley, Todmorden, by Mr. A. Stansfield; Lichfield by Mr. J. Young; near Castle Malgwyn, Pembrokeshire, by Mr. W. Hutchison; in Carnarvonshire by Mr. Clift; and Glen Almond by Mr. J. Mc'Nab. Fronds five or six inches long, lanceolate, tapering upwards, breadth one inch; segments imbricated, dense, and oblong-acute. Fertile fronds six or seven inches long, pinnate, with crowded acute segments. Handsome and distinct, with more or less erect fronds, forming a dense bush with a hollow centre.

CONTRACTA, Lowe, (*contractum*, Stansfield.) (Plate LX.—C.)—Discovered in July, 1859, in Conway Valley, North Wales, by Mr. J. Holmes. This variety is quite constant. In beauty it is a gem. Pinnules remarkably narrow for the lower half of the frond, above larger, irregular, and somewhat triangular in form; the apex attenuated; the basal contracted pinnules incised. Length of sterile frond five inches.

CONTRACTA-RAMOSA, Lowe. (Plate LX.—D.)—Discovered on

the Clova Mountains, Scotland, in September, 1859, by Mr. J. Horsfall. Another very handsome Fern. The lower portion of the frond much contracted, but scarcely incised; the pinnules in the middle of the frond somewhat larger, irregular in form, but more or less triangular; at two inches from the apex branched, the pinnules larger, irregular, and the apex of the frond narrow and elongated.



Fig. 806.



Fig. 807.

SERRULATA, *Lowe*, (*serrulatum*, Stansfield, MS.) (Fig. 806.)—A dwarf form, with minute pinnæ at the base, gradually widening towards the apex, which is briefly caudate. Serrulate. Length four or five inches.

PROJECTO-MULTIFIDA, *Lowe*. (Fig. 807.)—A dwarf form of *projectum* having a branching apex. Found in Scotland by Mr. A. Tait.



Fig. 808.



Fig 809

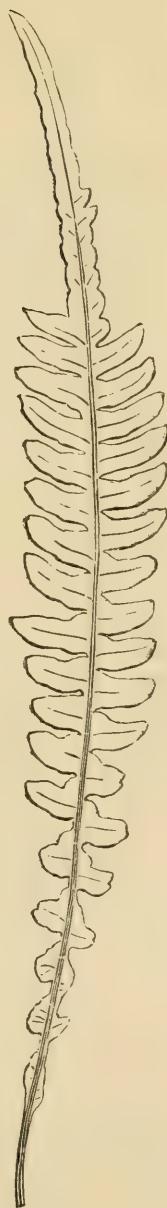


Fig 810

ANOMALA-LINEATA, *Lowe*. (Fig. 808.)—Found in Yorkshire by Mr. C. Monkman, of Malton. Length six inches. Pinnæ distant and linear, the basal half depauperate. A handsome form, with characters midway between this and *anomala*, has been forwarded to me from Berker Force, by Mr. C. Clowes.

ROTUNDATA, *Lowe*. (Fig. 809.)—Found by Mr. Clift. Pinnæ short and round, with several odd pinnæ ovate and projecting beyond the remainder. Apex also rounded. Length seven inches, width one fifth at the base and half an inch near the apex. Pinnæ very minute at the base and gradually widening to the centre of the frond.

CAUDATA, *Lowe*, (*caudatum*, Moore.) (Fig. 810.)—Larger than *lancifolia*. Length six to eight inches, width nearly an inch; thick and leathery. Apex caudate, entire or inconspicuously lobed, below which pinnatifid, segments linear-obtuse, the basal one third of the frond suddenly contracted into rounded lobes. Found at Eastwood by Mr. Stansfield.

DENTIGERA, *Lowe*, (*dentigerum*, Moore.)—Found near Windermere by Mr. F. Clowes. Sterile fronds eight to twelve inches long, and one inch and a half wide, gradually contracting below, and furcate at the tips. Segments acute, and irregularly dentate. Fertile fronds forked once or twice near the tips, and the segments sometimes forked.

ABRUPTA, *Lowe*, (*abruptum*, Moore.)—Found near Todmorden by Mr. Stansfield. Lower half normal, at which point the rachis terminates abruptly, the apex consisting of one or two segments set on endwise.

STRICTA-DADDsii, *Lowe*.—Irregular pinnæ of very various lengths, but the frond uniformly widest in the centre. Serrulate. Found near Ilfracombe by Mr. J. Dadds. Length eight inches.

BIFIDA, *Lowe*, (*bifidum*, Wollaston.)—Found at Braydon Burn, Durham, by Mr. T. Wilcke; Tunbridge Wells by Mr. G. B. Wollaston; Barnstaple by the late Mr. C. Jackson; and in Yorkshire by Mr. A. Clapham. A large form, the tips of

the segments and the apices of the fronds more or less bifid or trifid.



Fig. 811.

Fig. 812.

Upper portions of fronds, sterile and fertile.

DUPLEX, *Lowe*. (Figs. 811 and 812.)—A large form, found near Marwood, Devonshire, by the Rev. F. Mules. Length thirteen inches, width two inches. The barren fronds bifid five inches from the apex, and the fertile bifid one inch below the apex. The illustrations are from the Rev. F. Mules.

CLAPHAMII, *Lowe*, (*Platypteris*, Clapham.) (Fig. 813.)—A dwarf leafy slender-fronded form, found at Ilkley, Yorkshire, in 1863, by Mr. Clapham, of Scarborough. Length five inches.



Fig. 813.
Upper half of frond.



Fig. 814. Fig. 815.
Middle of frond. Apex.

MULTIFIDA, *Lowe*, (*multifidum* of Wollaston.) (Figs. 814 and 815.)—Found at Tunbridge Wells and Chiselhurst by Mr. G. B. Wollaston; Ilfracombe by Mr. J. Dadds; Marwood by the Rev. F. Mules; Nettlecombe by Mr. C. Elworthy; Peck Hill, Lancashire, by Mr. R. Morris; Malton by Mr. C. Monkman; Crumlin, in Monmouthshire, by Mr. T. H. Thomas; Ruthin, Denbighshire, by Mr. T. Pritchard; close to Loch Moidart, in Inverness-shire, by the Rev. T. F. Ravenshaw; and Quin Abbey, Clare, by the late Dr. J. R. Kinahan. Merely differing in being divided two or three times at the apex, yet neither uniformly nor symmetrically.

RAMOSA-CLIFTII, *Lowe*. (Fig. 816.)—Found near Birmingham by Mr. Clift, of Balsall Heath. Length four inches;

pinnæ small, rounded, irregular shaped, and depauperated. Apex multifid, very leafy, and ascending. The illustration is from Mr. Clift.



Fig. 816.



Fig. 817.



Fig. 818.

ATTENUATA, *Lowe*, (*attenuatum*, Stansfield.) (Fig. 817.)—A narrow attenuated form with distant pinnæ, broad at the base and short. Length seven inches, width six eighths of an inch. The illustration is from Messrs. Stansfield.

IMBRICATO-ERECTA, *Lowe*, (*imbricatum-erectum*, Stansfield.) (Fig. 818.)—An exceedingly beautiful form, differing from *erecta* in having narrower fronds, and in its dissimilar erect habit.

LATIFRONS, *Moore*.—Found at Eastwood and Pennant Clough by Mr. Stansfield, and in Mytholm Valley by Mr. Nowell and

Mr. Patman. A large form. Sterile fronds. Length six inches, width one inch and a half, lanceolate, rapidly contracting to the base; segments crowded, the longest are broad-linear, somewhat falcate, with a brief acute apex.



Fig. 819.

MONKMANII, *Stansfield*. (Fig. 819.)—A singular irregular form with variable pinnæ, broad and flexuose; apex multifid.

TRINERVIA, *Lowe*, (*trinervium*, Wollaston.)—Found in 1854 on the Sugar-loaf Mountains in Wicklow, by the late Dr. Kinahan. Normal, except being less tapering below, and at the base producing on either side a small lateral branch.

Sometimes the apex of the frond and of the branches are forked. Both the sterile and fertile fronds have the basal branches.



Fig. 820.



Fig. 821.

RAMOSO-IRREGULARE, *Lowe*. (Fig. 820.)—Found in North Wales. Branching and re-branching. Pinnæ short and somewhat irregular.

CRISTATO-CRISPA, *Lowe*, (*cristato-crispum*, Clapham.) (Fig. 821.)—A variety found by Mr. Clapham, of Scarborough, which is branched, crested at the apices, and crisped.

IMBRICATO-SUBSERRATA, *Lowe*, (*imbricatum-subserratum*, Stansfield.)—A subserrated form of *imbricatum*, the fronds I have seen being only subimbricate. Dwarf.

CRISPATA, *Lowe*, (*crispatum*, Moore.)—Found near Barnstaple, by the late Mr. C. Jackson; and near Todmorden, by Mr. A. Stansfield. A small crispy form, with the apex simple.



Fig. 822.

Fig. 823.—Serrulata, page 394.*

FLABELLATA, *Lowe*, (*flabellatum*, *Stansfield*.) (Fig. 822.)—This is the most remarkable *Blechnum* yet found. It is scarcely to the species what *Acrocladon* is to *Athyrium*, but is equally as remarkable as that fine form, and what is singular was found in the same vicinity (near Helmsley, Yorkshire,) by the same

* Figs. 806 and 807, at page 394, are both *Projecto-multifida*.

discoverer, Mr. Monkman, of Malton, who holds the only plant known, and sends the fronds for illustration. Mr. Monkman first named this fine plant *ramo-cristatum*, but in consequence of the more markedly fan-like forms assumed by the strongly-developed fronds, and the constantly increasing tendency to dichotomous forking, he was induced to adopt the name "*flabellatum*" as being the most descriptive. The plant is robust, but has not yet proved fertile. The fronds branch into two, three, or four, at the stipes, each division again repeatedly forking, and the same process repeating until the flabellate form is made up of a dense mass of foliage. The large flat fronds hanging over the pot are very striking.



Fig. 824.



Fig. 825.

MARGINATO-IRREGULARE, *Lowe*. (Fig. 824.)—Normal in size, the peculiarity consisting in the variable character of the pinnæ, no two being alike, some depauperate, truncate or branched, making an irregular outline.

CONFLUENS, *Lowe*. (Fig. 825.)—Pinnæ irregular in size, form, and position, a portion overlapping each other. Frond normal in size.

ALPHABETICAL

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GENUS XI.

PTERIS. LINNÆUS.

FRONDS herbaceous or coriaceous, varying from decompound to pedate, often large. Sori marginal, linear, and covered with an indusium. Only one British example.



PTERIS ACUTILoba.—TINEA.

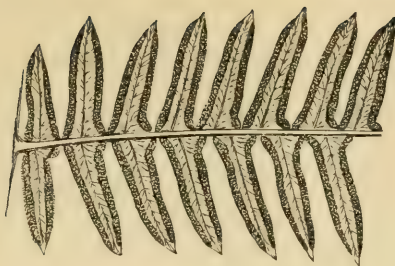


Fig. 826.—Portion of pinna of mature Frond, under side.

PTERIS AQUILINA.

LINNÆUS.

Bracken or Common Brakes.

PLATE LXI.

<i>Pteris aquilina,</i>	LINNÆUS. BOLTON. SMITH. BABINGTON.
" "	HOOKE AND ARNOTT. MACKAY. DEAKIN.
" "	NEWMAN. SOWERBY. MOORE. BENTHAM.
" "	SWARTZ. SCHUHR. KOCH. WILLDENOW.
" "	SPRENGEL. STURM. FRIES. LEDEBOUR.
" "	AGARDH. SVENSK. METTENIUS. FEE.
" "	NYMAN. E. J. LOWE.
" <i>caudata,</i>	LINK.
" <i>brevipes,</i>	TAUSCH.
" <i>borealis,</i>	SALISBURY.
" <i>femina,</i>	GRAY.
" <i>nudicaulis,</i>	GÜLDENSTADT.
" <i>excelsa,</i>	BLUME.
" <i>recurvata,</i>	WALLICH. AGARDH.
" <i>terminalis,</i>	WALLICH.
" <i>Wightiana,</i>	WALLICH.
" <i>firma,</i>	WALLICH.
" <i>densa,</i>	WALLICH.
" <i>lanuginosa,</i>	BOBY. WILLDENOW. SPRENGEL. LINK.
" "	KAULFUSS. AGARDH. FEE.
" <i>decomposita,</i>	GAUDICHAUD.
" <i>villosa,</i>	FEE.
" <i>revoluta,</i>	BLUME. AGARDH.

<i>Pteris Capensis</i> ,	THUNBERG. WILLDENOW. AGARDH.
“ “	SCHLECHTENDAL.
<i>Allosorus aquilinus</i> ,	PRESL. PAPPE AND RAWSON.
“ <i>arachnoideus</i> ,	PRESL.
“ <i>recurvatus</i> ,	PRESL.
“ <i>Tauricus</i> ,	PRESL.
“ <i>caudatus</i> ,	PRESL.
“ <i>Capensis</i> ,	PAPPE AND RAWSON, (<i>not of</i> BERNHARDI <i>or</i> PRESL.)
“ <i>lanuginosus</i> ,	PRESL.
“ <i>villosus</i> ,	PRESL.
“ <i>Hottentottus</i> ,	PRESL.
“ <i>acutifolius</i> ,	PRESL.
<i>Pæsia aquilina</i> ,	MOORE.
<i>Asplenium aquilinum</i> ,	BERNHARDI.
<i>Eupteris aquilina</i> ,	NEWMAN.

Pteris—From *pteron*, Greek for a wing.

Aquilina—Eagle-like.

FRONDS deep green, variable in size, from six to one hundred and fifty inches long, according to situation; when dwarf triangular and bipinnate, when vigorous elongated and tripinnate.

Pinnæ opposite and distant, and oblong-ovate.

Pinnules narrow-lanceolate, contiguous, sometimes caudate. Ultimate segments sessile, with apex blunt.

Caudex thick, extensively creeping, black and velvety. Venation circinate.

Stipes lateral; spindle-shaped. Rachis channeled above, rounded behind.

Veins forked. Sori abundant, linear, continuous, indusiate, and marginal. Indusium double.

Found throughout Great Britain and Ireland, and is our most common species, growing from the level of the sea to an altitude of two thousand feet. Also common throughout Europe as far north as Lapland. Found in the Caucasus, in the Ural and Altai Mountains, Siberia, Sitka, China, Kamtschatka, throughout India, Ceylon, Penang, Java, Philippines, Sandwich Isles, Cape of Good Hope, Sierra Leone, Abyssinia, Fernando Po, Senegambia, Bourbon, Mauritius, Algiers, Madeira, Canaries, Azores, Isle of Teneriffe, Cape de Verd, Guatemala, California, Mexico, Pernambuco, Veragua, Canada, Massachusetts, and Kentucky.

Extensively used in some districts as bedding for cattle, and as thatch; as fuel, and for packing; also for preservation of plants

from frost. The underground stems are capable of being used as food.

This species will grow in almost any soil, but requires some care in transplanting, and can only be successfully moved when dormant in winter.

There are several varieties, namely:—



Fig. 827.

BISULCA, *Loew*. (Fig. 827.)—A slender form with the costa splitting for three or four inches at the apex, and bearing
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exteriorly ordinary pinnæ, and on the inner edges small abortive pinnæ.

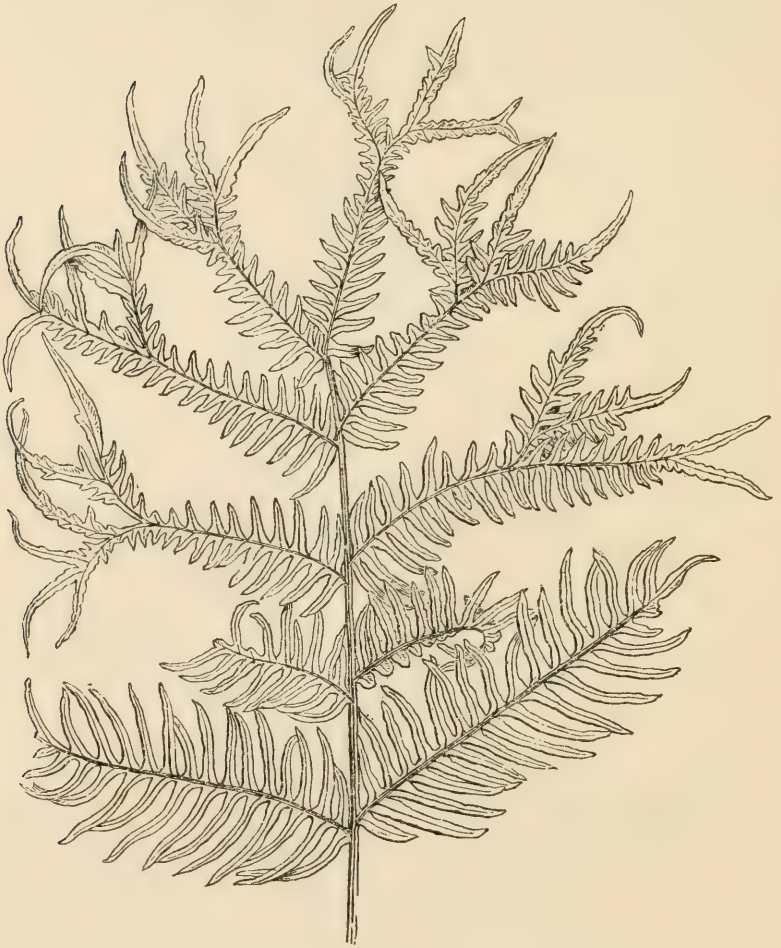


Fig. 828.

CRISTATA, *Moore*. (Fig. 828.)—A magnificently crested form. Fronds normal in size, the apex of each pinna repeatedly branching, the branches having caudate, bicaudate, or tricaudate apices.



Fig. 829.—Apex.



Fig. 830.—Pinna.

FURCANS, *Lowe*. (Figs. 829 and 830.)—A broad-pinnuled form; the pinnae irregular and furcately branched, and the apex of the frond multifid. Normal in size. Found near Birmingham by Mr. F. A. Edelsten.



Fig. 831.

RAMOSO-IRREGULARE, *Clapham*. (Fig. 831.)—Pinnae and pinnules irregular in size. Pinnae branching and re-branching near their apices. Normal in size.

INTEGERRIMA, *Moore*.—Found at Marwood by the Rev. F. Mules; Hampstead Heath, Tarbet in Dumbartonshire, and near Loch Katrine, by Mr. T. Moore; St. Albans by Mr. H. D. Henslow; High Wycombe and Potton by Mr. R. Heward; in Teesdale and Windermere by Mr. F. Clowes; and in County Wicklow and Dublin by Mr. R. Barrington. Differing in the secondary pinnules being entire, that is undivided, instead of deeply pinnatifid. Only slightly crenate-lobate at the base.

CRISPA, *Wollaston*.—Found on Hampstead Heath by Mr. T. Moore; Shooter's Hill by Mr. G. B. Wollaston; Marwood by the Rev. F. Mules; and Mapperby Plains by Mr. Brown. Occasionally multifid. There are two forms; in one the margins of the pinnulets (or secondary pinnules) are entire, undulate and reflexed, in the other they are crenate and wavy.

MULTIFIDA, *Wollaston*.—Found at Chisclhurst and Ottery St. Mary by Mr. G. B. Wollaston; Chagford, in Devon, by the Rev. J. M. Chanter; Windermere by Mr. F. Clowes; Keswick by Miss Wright; Guernsey by Mr. C. Jackson, Mr. J. James, and Miss Isabella Wilkinson; Cobham Park, Kent, by Mr. S. O. Gray; and Barnstaple by Mr. H. F. Dempster. There are two forms; in one the apices of the fronds and primary pinnæ are multifid and crisped; in the other not branched, but the pinnules and pinnulets are divided.

DEPAUPERATA, *Wollaston*.—Found near Chisclhurst by Mr. G. B. Wollaston; Bowness by Mr. Wood; and Marwood by the Rev. F. Mules. Sometimes irregularly branched, and the shortened lobes decurrent and depauperated or interrupted.

GENUS XII.

ADIANTUM. LINNÆUS.

FronDS simple to supra-decompound. Stipites and rachides ebeneous. Sori indusiate, transverse marginal, from linear to reniform.

Veins repeatedly forked.

The spore-cases are attached to the surface of the indusium, and resupinate.

Mr. Moore in his "Species Filicum" enumerates one hundred and twenty-six species.

A very large family, yet only one British species.



ADIANTUM CAPILLUS-VENERIS.



Fig. 832.—Portion of mature Frond, under side.

ADIANTUM CAPILLUS-VENERIS.

LINNÆUS.

Common Maiden-hair Fern.

PLATE LXII.

<i>Adiantum capillus-veneris</i> ,	LINNÆUS. BOLTON. SMITH. BABINGTON.
“ “	HOOKE AND ARNOTT. MACKAY. PRESL.
“ “	J. SMITH. DEAKIN. MOORE. SOWERBY.
“ “	NEWMAN. BENTHAM. JACQUIN. KOCH.
“ “	WILLDENOW. FEE. NYMAN. LEDEBOUR.
“ “	METTENIUS. E. J. LOWE. BRACKENRIDGE.
“ “	SWARTZ. DESVAUX. (<i>Not of</i> SPRENGEL.)
“ <i>tenerum</i> ,	ROXBURGH. (<i>Not of</i> SWARTZ, SPRENGEL,
	WILLDENOW, DESVAUX, PRESL, LINK,
	KUNZE, MOORE, HOOKER, FEE, LOWE,
	METTENIUS, LINK, MARTENS & GALLEOTTI,
	<i>or</i> SCHKUHR.)
“ <i>trifidum</i> ,	WILLDENOW. BOLLE.
“ <i>repandum</i> ,	TAUSCH.
“ <i>Moritzianum</i> ,	LINK. KUNZE. FEE.
“ <i>Africanum</i> ,	BROWN.
“ <i>Capillus</i> ,	SWARTZ. SPRENGEL. LINK. KUNZE. WALLICH.
“ <i>coriandrifolium</i> ,	LAMARCK.
“ <i>cuneifolium</i> ,	STOKES.
“ <i>dependens</i> ,	CHAPMAN.
“ <i>fontanum</i> ,	SALISBURY. GRAY.

Adiantum—From the Greek *Adiantos*, dry. *Capillus-veneris*—Venus' Hair.

FOUND in Cornwall and Devonshire abundantly, sparingly in Somersetshire, namely, Clevedon by Mr. L. H. Grindon; Cheddar Cliffs by the Rev. W. H. Hawker; and Combe Down by myself; Titherstone Clee Hill, Shropshire, by Mr. Westcott. In Glamorganshire, Galway, Kerry, Clare, Jersey, Guernsey, Isle of Man, Barry Island, and Arran Isles.

Occurring in Switzerland, Belgium, France, Spain, Portugal, Italy, Dalmatia, Greece, Turkey, throughout India, Java, China, Persia, Syria, Caucasus, Siberia, Algiers, Egypt, Abyssinia, Teneriffe, Madeira, Canary, Cape de Verd, the Azores, Madagascar, Mascaren Islands, Natal, Algoa Bay, Florida, Arkansas, Alabama, California, Texas, Mexico, Guatemala, Parra, Caraccas, Chili, Trinidad, St. Vincent, Dominica, Jamaica, Sandwich Islands, Caledonia, New Hebrides, etc.

Fronds ovate or triangular, or lanceolate, smooth, membranaceous, bipinnate or tripinnate, bright green, slender, drooping. Length from six to twenty-four inches. Pinnæ and pinnules alternate. Pinnules stalked, base somewhat cuneate obliquely, apex rounded, the posterior margins entire, the anterior ones lobate, in the sterile fronds the lobes are toothed. Sori oblong, situated on the apices of all the lobes. The indusium is the reflexed portion of the apex of the lobe, thin in texture, and veiny. Venation circinate. Caudex slowly creeping. Stipes as long as the frond. Stipes and rachis slender, ebeneous, and shining.

Mostly an inhabitant of sea cliffs. In 1860 I found this Fern abundant on the sea cliffs opposite the ladies' bathing place at Santander, in Spain, dwarf and stunted; fifty or sixty miles inland, at Las Caldas, it was most luxuriant, growing between crevices in rocks. I measured some two feet in length. It was also met with in the Congosto Pass near Allar, and seemed not uncommon along the spurs of the Pyrenees.

Not hardy, requiring the protection of a greenhouse, and flourishing best in a warm house. Broken peat and silver sand, with a little loam, is the proper compost.

There are a few varieties:—



Fig. 833.

INCISUM-FOOTII, *Lowe*. (Fig. 833.)—A remarkably handsome much-cut form, found in County Clare by Mr. J. F. Foot. Length fifteen inches. I am indebted to Mr. Foot for fronds.

RAMULOSUM, *Moore*.—Found in Ireland and brought into notice by Mr. A. Clapham, of Scarborough. The main rachis

divides near the top two or three times, forming a spreading tuft of brief pinnate branches. In the lower portion of the frond the pinnules are narrow and partially depauperated.



Fig. 834.—Upper half of frond.

HOOKERII, *Lowe*. (Fig. 834.)—A remarkably slender form of our British Maiden-hair, found in the Crimea. Minute and slender in all its parts, with a close thick-set erect habit. Pinnæ, pinnules, and pinnulets alternate. Stipes, rachis, and rachides black. Pinnulets more rounded than wedge-shaped at the base, and very finely dentate at the rounded apex. Sori inconspicuous. My thanks are due to Dr. J. D. Hooker, Director of the Royal Gardens, Kew, for a plant.

ROTUNDATUM, Moore.—Found in the Isle of Man, by Mr. T. G. Rylands; the basal pinnules are rounder, with a truncate base; the fronds are narrow, and the pinnæ more spreading. The upper portion of the fronds nearly normal.



Fig. 835.—Pinnules.



Fig. 836.—Apex.

FOOTII, Lowe. (Fig. 835.)—Found at Ballyryan, County Clare, by Mr. J. F. Foot. Length eighteen to twenty-four inches, some of the pinnules being as much as an inch wide. I am indebted to Mr. Foot for fronds.

DEPAUPERATUM, Clapham. (Fig. 836.)—An interesting sport from a batch of seedlings received from Mr. James, of Vauvert, by Mr. Clapham. Length twelve inches. Narrow and much cut, and depauperated. I am indebted to Mr. Clapham for fronds.

KALON, Lowe. (Fig. 837.)—A handsome form raised from spores. Length eleven inches, width five inches, broadest at the base, and gradually narrowing to the apex. Pinnules large and very leafy, the ultimate pinnules very large.



Fig. 837.—Basal pinna.

BULBIFERUM, *Lowe*. (Fig. 838.)—A pretty sport, differing in bearing little bulbils on the pinnæ. Length six inches. My thanks are due to Mr. Clapham, of Scarborough, for a plant.



Fig. 838.—Pinnules.



Fig. 839.—Pinnules.

INCISUM, *Moore*. (Fig. 839.)—Found in Ireland by Dr. Allchin; Menstone Bay, Devonshire, by Mr. E. Newman; and Guernsey by Mr. J. James. All the pinnules are split into long, narrow, cuneate lobes.

GENUS XIII.

CYSTOPTERIS. BERNHARDI.

CAUDEX tufted, decumbent, or creeping. Fronds membranaceous-herbaceous and bipinnate or tripinnate. Sori indusiate, rotundate, with the receptacles medial and dot-like. Indusium concave. Fronds delicate.

There are three British species, namely, *C. fragilis*, *C. regia*, and *C. montana*.



Adiantum fragilis.



Fig. 840.—Portion of mature frond, under side.

CYSTOPTERIS FRAGILIS.

BERNHARDI.

The Brittle Bladder Fern.

PLATE LXIII.

<i>Cystopteris fragilis</i> ,	BERNHARDI. HOOKER AND ARNOTT.
“ “	BABINGTON. DEAKIN. NEWMAN. FEE.
“ “	MACKAY. MOORE. BENTHAM. SCHOTT.
“ “	SOWERBY. LINK. PRESL. METTENIUS.
“ “	KOCH. LEDEBOUR. FRIES. A. GRAY.
“ “	PAPPE AND RAWSON. E. J. LOWE.
“ “	RUPRECHT. KUNZE.
“ <i>orientalis</i> ,	DESVAUX.
“ <i>viridula</i> ,	DESVAUX.
“ <i>rhætica</i> ,	LINK. FEE.
“ <i>dentata</i> ,	HOOKER. DESVAUX. FEE. SOWERBY.
“ “	BABINGTON.
“ <i>Pontederæ</i> ,	LINK.
“ <i>Jamaicensis</i> ,	DESVAUX.
“ <i>fumarioides</i> ,	KUNZE. FEE.
“ <i>retusa</i> ,	DECAISNE.
“ <i>Chilensis</i> ,	FEE.
“ <i>Dickieana</i> ,	SIM. NEWMAN. MOORE. E. J. LOWE.
<i>Cystea fragilis</i> ,	SMITH.
“ <i>regia</i> ,	SMITH.
“ <i>angustata</i> ,	SMITH.
“ <i>dentata</i> ,	SMITH.

<i>Cyathea fragilis</i> ,	SMITH. ROTH.
“ <i>cynapifolia</i> ,	ROTH.
“ <i>anthriscifolia</i> ,	ROTH.
“ <i>regia</i> ,	ROTH.
“ <i>dentata</i> ,	SMITH.
<i>Cyclopteris dentata</i> ,	GRAY.
“ <i>fragilis</i> ,	GRAY.
<i>Polypodium fragile</i> ,	LINNÆUS. BOLTON. POIRET. VILLARS.
“ <i>anthriscifolium</i> ,	HOFFMANN.
“ <i>cynapifolium</i> ,	HOFFMANN.
“ <i>polymorphum</i> ,	VILLARS.
“ <i>laciniatum</i> ,	VILLARS.
“ <i>trifidum</i> ,	WITHERING.
“ <i>album</i> ,	LAMARCK.
“ <i>fumarioides</i> ,	WEIS. HOFFMANN.
“ <i>tenuë</i> ,	HOFFMANN.
“ <i>rhæticum</i> ,	DICKSON. BOLTON. WITHERING.
“ “	POIRET.
“ <i>dentatum</i> ,	DICKSON.
“ <i>Pontederæ</i> ,	ALLIONI. SWARTZ.
“ <i>tenerimum</i> ,	POIRET.
<i>Aspidium fragile</i> ,	SWARTZ. WILLDENOW. SCHKUHR.
“ “	SPRENGEL. KAULFUSS. STURM. NYMAN.
“ <i>trifidum</i> ,	SWARTZ.
“ <i>diaphanum</i> ,	BORY.
“ <i>viridulum</i> ,	DESLAUX.
“ <i>Nepalense</i> ,	EDGEWORTH.
“ <i>rhæticum</i> ,	WILLDENOW.
“ <i>dentatum</i> ,	SWARTZ. WILLDENOW. SPRENGEL.
“ <i>Pontederæ</i> ,	WILLDENOW. POIRET. NYMAN.
“ <i>colobodon</i> ,	KUNZE.
<i>Athyrium Pontederæ</i> ,	DESLAUX.
“ <i>fumarioides</i> ,	PRESL.
“ <i>dentatum</i> ,	GRAY.
“ <i>rhæticum</i> ,	SADLER.
“ <i>fragile</i> ,	SADLER.

Cystopteris—From the Greek *kystos*—a bladder, and *pteris*—a fern.

Fragilis—Fragile.

THIS pretty species grows in the fissures of moist rocks, usually in the shade, occurring from the sea level to three thousand feet elevation. Widely distributed, and most abundant in mountainous districts. A native of every county in Great Britain, yet least common in the south of England. In Ireland



Var. *Pentata*.



Adiantum

confined to the west and north-west. Extending to the north of Scotland, as far as Orkney. Abroad it occurs throughout Europe; also along the Ural and Altai ranges, Siberia, Kamtschatka, Asia Minor, Affghanistan, Kashmir, Simla, Nepal, Thibet, the Himalaya range; Abyssinia, Cape of Good Hope, Madeira, Teneriffe, Canaries, Azores, Greenland, Labrador, Canada, United States, California, Mexico, Guatemala, Columbia, Xalapa, Quito, Peru, Jamaica, Cuba, Bahamas, New Grenada, Chili, and Tasmania.

Cystopteris fragilis delights to occupy crevices in limestone rocks that are somewhat moist, and its pretty small fragile fronds are a pleasing feature in those districts in which it is sufficiently abundant. In a situation that is suitable to this species its spores germinate in great abundance.

In 1860 I found it remarkably abundant in Spain along the damp rocks on the Vilia Escusa, between Reinosa and Allar, whilst in the more exposed situations it was not to be found; it was also abundant near Santander and Las Caldas. In various parts of England it is not uncommonly so abundant as to give a character to the place; thus at Matlock, in Derbyshire, near Chaigeley, in Lancashire, about Bath, in the lake district, and in numerous parts of North and South Wales it lives in lovely luxuriance.

When grown as a pot plant this Fern should have ample drainage, and the usual proportions of turfy peat and loam, with a liberal supply of sand and small lumps of limestone. It succeeds well as a cultivated plant.

The fronds are frequently attacked by *Uredo filicum*, a yellow fungus, which seriously disfigures those plants that are attacked by it.

There are some interesting varieties, namely:—

DENTATA, Hooker. (Plate LXIV.—A.)—A common widely-spread form. Length six to eight inches; bipinnate or sub-bipinnate; pinnules oblong, bluntly dentate. Sori nearly marginal. Fronds narrow.

SEMPERVIRENS, Moore.—Said to have been found at Tunbridge Wells, and in Devonshire. A native of Madeira, and perhaps

a distinct species. Some obscurity hangs over it as a British plant. In a cool greenhouse evergreen. Stipites stout and tough. The anterior basal pinnules larger than the posterior ones. Indusium glandular hirsute. Rhizoma brief, creeping. Fronds narrow-lanceolate; pinnules distinct and ovate; lobes blunt.



Fig. 841.



Fig. 842.

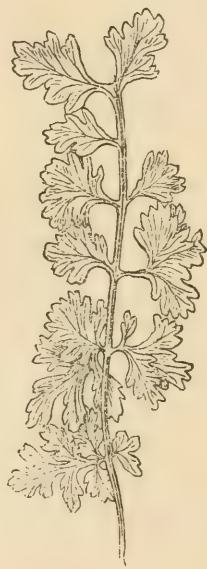


Fig. 843.

DECURRENS, Moore. (Fig. 841.)—Found at Silver Cove, near Wemyss Castle, Fifeshire, by Mr. Tait, of Edinburgh. Partaking of characters intermediate between *dentata* and *Dickieana*. Pinnæ deflexed, pinnules decurrent. The apices of the fronds and pinnæ acute. Prominently dentate.

CRISPA, Lowe. (Fig. 842.)—A singular dwarf variety, with short distant pinnæ and crisped pinnules.



Adiantum
sp.
1888

TRUNCATA-INTERRUPTA, *Lowe*. (Fig. 843.)—A remarkable variety, with short pinnules, very various in form and size, some depauperate and others wanting. Truncate.



Fig. 844.—Basal pinnae.

ADIANTOIDES, *Lowe*. (Fig. 844.)—A large much-divided luxuriant-growing variety, found in Scotland.



Fig. 845.—Basal pinnae.

GRACILE, *Lowe*. (Fig. 845.)—A slender, large form. Length thirteen inches, width three inches and a half in the centre of the frond. Pinnæ sub-opposite in the lower half of the frond, and alternate above. Pinnæ and pinnules distant, the basal three pairs of pinnæ very distant; the apices of the pinnæ dentate-caudate.

DICKIEANA, *Moore*. (Plate LXV.)—Found in a cave at

Cove, near Aberdeen, by Dr. Dickie; two miles east of Cove by the late Mr. C. Barter; near Dunkeld by Professor Balfour; and the Great Isle of Arran, in Galway, by Mr. D. Moore, of the Glasnevin Gardens. A very distinct form. Pinnæ deflexed, ovate-lanceolate, slightly twisted, imbricated; pinnules broad, oblong, with short obtuse blunt dentation, crowded, imbricated, and decurrent. Bipinnate, or more usually sub-bipinnate. Sori nearly marginal and tuberculate.



Fig. 846.—Apex.

Fig. 847.—Middle of frond.

Fig. 848.—Basal pinnæ.

INTERRUPTA, *Wollaston*. (Figs. 846, 847, and 848.)—Found in Westmorland by Mr. I. Hudhart, and made known by Mr. F. Clowes, of Windermere. A distinct form. Fronds long and very narrow, pinnæ interrupted and contracted, with irregular more or less fan-shaped pinnules, which are variously truncated, laciniated, or depauperated. Fronds sometimes almost linear, and occasionally bifid or multifid. A remarkable monstrosity, the basal pinnæ often normal, as in the illustration. Length of frond fifteen inches, of which the basal six inches



Var. *Furcans*.

is the stipes; width from half an inch to an inch. Stipes and rachis red. I am indebted to Mr. Clapham for a plant, and to Mr. F. Clowes for fronds.

FURCANS, *Moore*. (Plate LXVI.)—Found at Killin, Perthshire, by Mr. S. O. Gray, and in the Clova Mountains by Messrs. Stansfield, of Todmorden. Not unlike *dentata*, with the apices of the pinnæ furcate, or sometimes two or three times forked.



Fig. 849.—Middle of frond.



Fig. 850.—Apex.

DAVALLIOIDES, *Lowe*. (Fig. 849.)—An interesting form, not unlike some of the *Davalliæ*; sent from Scotland as an *Athyrium*. Pinnules broad and very leafy, the superior basal pinnules very large, their apices blunt. Sori large and conspicuous. Length nine inches, width three inches.

OBTUSA, *Moore*. (Fig. 850.)—Found near Whitby by Mr. A. Clapham; in Westmorland, at Whitbarrow, by Mr. G. B.

Wollaston, and Kentmere by Mr. F. Clowes; in Borrowdale, Cumberland, by Mr. G. B. Wollaston; Llyn Ogwen, Carnarvonshire, by Mr. S. O. Gray; and in Scotland by Mr. A. Tait. Length twelve inches, lanceolate; pinnules peculiarly short, blunt, rounded, ovate, and briefly stalked; lobes profoundly pinnatifid and oblong, margin narrow, bluntly dentate. Colour deep green.



Fig. 851.—Upper half of frond.

CRISTATA, *Lowe*. (Fig. 851.)—This most interesting crested form of *Cystopteris fragilis* was raised from spores by Mr. C. Elworthy, of Nettlecombe, near Taunton, and this is another of those remarkable forms for which we are indebted to the gardener of Sir Charles Trevellyn. The pinnæ are somewhat distant, and in the lower half of the frond conspicuously crested, becoming more or less normal in the upper half and

branching and cristate at the apex. Length eight inches. My thanks are due to Mr. Elworthy for fronds.



Fig. 852.—Base.



Fig. 853.—Base.

QUADRATA, Clapham. (Fig. 852.)—Gathered in 1865 by Mr. A. Clapham, of Scarborough, near Rydal. A narrow quadrate form, six inches in length. Pinnæ sub-opposite, very remote at the base. The apex of the pinnules and also the lobes of the basal pinnules flat and minutely dentate. I am indebted to Mr. Clapham for a frond.

PULCHERRIMA, Lowe. (Fig. 853.)—Found in the lake district by Mr. James, of Vauvert. A form of *Cystopteris fragilis* not unlike *Woodsia ilvensis* in general appearance. Length seven inches, width one inch and three quarters. Pinnæ ascending, very distant below. Pinnules narrow, with blunt apices. Hirsute and copiously fertile. The illustration is from Mr. James.

ANGUSTATA, Smith.—A not uncommon form, found in Devonshire; at Matlock and Castleton, in Derbyshire; Yorkshire, Westmorland, Cumberland, Carnarvonshire, Lough Gill, Sligo, and in several parts of Scotland. Length twelve inches. Fronds

slender, and with a subcordate apex. Bipinnate. Pinnæ long, tapering, pointed; pinnules oblong-lanceolate, acute, the larger pinnules profoundly lobed with sharp dentate segments. A subconstant form.

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THE FERN ROOT

LXVII



Fig. 854.—Portion of mature Frond, under side.

CYSTOPTERIS REGIA.

DESVAUX.

The Alpine Bladder Fern.

PLATE LXVII.

<i>Cystopteris regia</i> ,	DESVAUX. PRESL. FEE. MOORE. KOCH.
“ “	E. J. LOWE.
“ <i>alpina</i> ,	DESVAUX. LINK. HOOKER AND ARNOTT.
“ “	BENTHAM. BABINGTON. METTENIUS.
“ “	MOORE. SOWERBY.
<i>Cystea alpina</i> ,	SMITH.
“ <i>regia</i> ,	SMITH.
<i>Cyathea regia</i> ,	FORSTER. SMITH.
“ <i>alpina</i> ,	SMITH. ROTH.
“ <i>incisa</i> ,	SMITH.
<i>Cyclopteris regia</i> ,	GRAY.
<i>Aspidium regium</i> ,	SWARTZ. WILLDENOW. SPRENGEL. NYMAN.
“ <i>alpinum</i> ,	SWARTZ. WILLDENOW. SCHKUIER. STURM.
“ “	SPRENGEL.
“ <i>Taygetense</i> ,	BORY AND CHAUBARD.
<i>Polypodium regium</i> ,	LINNÆUS. POIRET.
“ <i>album</i> ,	LAMARCK.
“ <i>alpinum</i> ,	WULFEN. JACQUIN. POIRET.
“ <i>crispum</i> ,	GOUAN.
“ <i>polymorphum</i> ,	VILLARS.

Cystopteris—From the Greek, *kystos*—a bladder, and *ptēris*—a Fern.
Regia—Royal.

AN exceedingly interesting uncommon British species.

Fronds subtripinnate. Length three to eight inches. Colour pale green. Erect in habit, and lanceolate in form.

Pinnæ unequal, ovate, and acute.

Pinnules profoundly pinnatifid, ovate, lobes more or less linear, and obscurely dentate.

Caudex brief and tufted.

Stipes variable in length, and slender.

Veins branched.

Sori abundant, crowded, circular, small, and medial.

Indusium thin, transparent, and reflexed. Deciduous.

Found some seventy years ago in great abundance on a wall at Low Leyton, in Essex, but now rare.

Abroad it is found abundantly in the Alps; also a native of Sweden, France, Italy, Spain, Belgium, Greece, Hungary, Dalmatia, Croatia, Transylvania, and in Asia Minor.

Easily cultivated, if well drained and grown in a mixture of light loam, turfy peat, and sand.

There are no varieties.



FER. NO. 111.

LXVIII



Fig. 855.—Pinna of fertile frond, under side.

CYSTOPTERIS MONTANA.

BERNHARDI.

The Mountain Bladder Fern.

PLATE LXVIII.

<i>Cystopteris montana</i> ,	BERNHARDI. HOOKER AND ARNOTT. FEE.
“ “	PRESL. LINK. NEWMAN. BABINGTON.
“ “	DEAKIN. MOORE. BENTHAM. KOCH.
“ “	SOWERBY. LEDEBOUR. E. J. LOWE.
“ <i>Allioni</i> ,	NEWMAN.
“ <i>Myrrhidifolia</i> ,	NEWMAN.
<i>Cyathea montana</i> ,	SMITH. ROTH.
<i>Athyrium montanum</i> ,	RÖHLING.
<i>Aspidium montanum</i> ,	SWARTZ. SCHKUHR. WILLDENOW.
“ “	SPRENGEL. NYMAN.
<i>Polypodium montanum</i> ,	LAMARCK. ALLIONI. HENKE. POIRET.
“ <i>Myrrhidifolium</i> ,	VILLARS.

Cystopteris—From *kystos*—a bladder, on account of the inflated indusium,
and *pterus*—a Fern. *Montana*—Mountain.

A DISTINCT species, with triangular, fragile, tripinnate fronds, and having a long creeping rhizoma.

Found first in 1836, on Ben Lawers, in Perthshire, by Mr. W. Wilson, and since then by other botanists on mountains

dividing Glen Dochart and Glen Lochy. More recently Mr. J. Backhouse has found it in Canlochen, at the head of Glen Isla, Clova, in Fifeshire.

It grows on mica schist in moist alpine situations, and is one of our rarest British Ferns.

It is found abroad in Lapland, Norway, Sweden, Denmark, France, Germany, Spain, Italy, Switzerland, Hungary, Kamtschatka, and in the Rocky Mountains.

Caudex creeping. Stipes slender, and longer than the frond; sparingly scaly, and dark coloured at the base. Rachis and rachides narrowly margined above.

Length of frond from four to twelve inches, the leafy portion being only three or four inches; deep green in colour, smooth, triangular in form, and tripinnate. Pinnæ ascending, the basal pair very much the largest, being as much as two inches and a half in length. Obliquely ovate, the posterior pinnules double the length of the anterior pinnules. The lower pinnæ unequal-sided.

The larger pinnules pinnate, the others pinnatifid. Lobes oblong-ovate, with bidentate acute teeth.

Sori medial and indusiate, covering the whole of the under surface with roundish spore-cases.

Indusium thin and transparent.

Costa nearly straight, with alternate veins, one in each lobe.

In cultivation this plant should be grown in a shallow pan, using an open compost, mixed with sphagnum, coarse sand, and fragments of charcoal or stone. It requires abundance of moisture, yet cannot endure stagnant water.

There are no varieties.

GENUS XIV.

WOODSIA. R. BROWN.

A SMALL genus containing, according to the late Sir W. J. Hooker, in his valuable and comprehensive "Species Filicum," the following:—

- Mollis*, a native of Mexico.
- Guatemalensis*, of Guatemala.
- Peruviana*, of Peru.
- Cumingiana*, of Chili.
- Caucasica*, from the Caucasus.
- Elongata*, of Northern India.
- Obtusa*, of North America.
- Incisa*, from the Argentine Republic.
- Ilvensis*, British.
- Hyperborea*, British.
- Glabella*, from the Great Bear Lake.

A twelfth species has more recently been discovered in Japan, and has received the name of *Polystichoides*.

Fronds membranaceous, diminutive, pinnato-pinnatifid or bipinnate. Caudex tufted, erect, or decumbent. Sori indusiate. Indusium calyciform.

There are two British species, growing in mountainous districts, and both very rare.





Fig. 856.—Plant, natural size, procured by Mr. Sidebotham.

WOODSIA HYPERBOREA.

R. BROWN.

The Alpine Woodsia.

PLATE LXIX.

Woodsia hyperborea,

“ “

“ “

“ “

“ “

“ *alpina*,

“ “

“ *Ilvensis*, var.,

“ *intermedia*,

“ *pubescens*,

R. BROWN. HOOKER AND ARNOTT.

SMITH. MOORE. SOWERBY. FEE.

NYMAN. SPRENGEL. DESVAUX.

LINK. FRIES. LEDEBOUR.

RUPRECHT. E. J. LOWE.

GRAY. NEWMAN. TAUSCH.

DEAKIN. MOORE.

BABINGTON.

RUPRECHT.

OPIZ.

<i>Acrostichum alpinum</i> ,	BOLTON. POIRET.
“ <i>hyperboreum</i> ,	LILJEBLAD.
<i>Cetrach alpinum</i> ,	DE CANDOLLE.
<i>Polypodium arvenicum</i> ,	SMITH.
“ <i>hyperboreum</i> ,	SWARTZ. SMITH. SCHKUH. R.
“ “	PRESL. WILLDENOW. STURM.
“ “	WEBER AND MOHR.
“ <i>hyperboreum</i> , var. <i>gracile</i> ,	WAHLENBERG.
“ <i>Ilvensis</i> ,	WITHERING.
“ <i>fontanum</i> ,	LINNÆUS.

Woodsia—Named in honour of Joseph Woods, a celebrated British botanist.

Hyperborea—Northern.

A SPECIES even more rare than *Woodsia Ilvensis*. It has been found in North Wales, on Snowdon, by Mr. L. Clark. In Scotland Professor Balfour has found it near Crieff, (on Ben Chonzie,) Perthshire; Glen Isla, Forfarshire; and on the Clova Mountains, (Glen Fiadh.) Mr. Dickson and Mr. W. Wilson on Ben Lawers, Mael-dun-Crosk, Catjaghiamman, on Craig Challiach, Perthshire; and Mr. J. T. Syme between Glen Lochy and Glen Dochart.

It is a native of Finland, Lapland, Sweden, Russia, Norway, Germany, France, Switzerland, Spain, Hungary, Transylvania, Silesia, Siberia, in the Punjab on the Himalaya, in America on the Rocky Mountains and in Massachusetts.

The fronds are linear, pinnate, without scales, though slightly hairy. Pinnæ somewhat triangular, pinnatifid, lobes roundish obovate.

Caudex brief.

Length of frond from two to six inches, membranaceous, and pale green in colour. Pinnæ mostly alternate, the basal ones distant.

Sori medial, circular in form, and copious.

Woodsia hyperborea differs from *Woodsia Ilvensis* in having the fronds smaller, narrower, and smoother. Under cultivation the *Woodsias* should be kept out of sunshine. Drain well, and use a compost of light loam, sand, a little peat, with charcoal and broken stones.

There are no varieties.



Adiantum species



Fig. 857.—A Welsh plant, natural size, found by Mr. Sidebotham.

WOODSIA ILVENSIS.

R. BROWN.

The Oblong Woodsia.

PLATE LXX.

<i>Woodsia Ilvensis</i> ,	R. BROWN. SMITH. DEAKIN. LINK.
“ “	HOOKER AND ARNOTT. BABINGTON.
“ “	SOWERBY. NEWMAN. MOORE. FRIES.
“ “	BENTHAM. SPRENGEL. KAULFUSS.
“ “	LEDEBOUR. METTENIUS. RUPRECHT.
“ “	A. GRAY. NYMAN. E. J. LOWE.
“ <i>hyperborea</i> var. <i>rufigidula</i> ,	KOCH.
“ <i>paleacea</i> ,	OPIZ.
“ <i>Raiana</i> ,	NEWMAN.
“ <i>rufigidula</i> ,	BECK.
“ <i>vestita</i> ,	SPRENGEL.
<i>Acrostichum Ilvensis</i> ,	LINNÆUS. HUDSON. BOLTON.
“ <i>Marante</i> ,	PALLAS. HENKE.
<i>Aspidium rufigidulum</i> ,	SWARTZ. WILLDENOW. POIRET.
“ <i>distans</i> ,	VIVIANA.
<i>Lastrea rufigidula</i> ,	PRESL.

<i>Nephrodium rufidulum</i> ,	MICHAUX.
<i>Nothochlæna rufidula</i> ,	DESLAUX.
<i>Polypodium Ilvense</i> ,	VILLARS. ROTH. SWARTZ. PRESL.
“ “	SCHKUR. WILLDENOW. STURM.
“ <i>arvenicum</i> ,	WITHERING.
“ <i>Marantæ</i> ,	HOFFMANN.

Woodsia—In honour of Joseph Woods, a celebrated British botanist.

Ilvensis—After the Island of Ilua.

ONE of our rarest British Ferns, occasionally found on the mountains of Westmorland, Cumberland, Durham, and Carnarvon.

In Scotland found near Loch Skene, Dumfriesshire, by the Rev. W. Little; north of Moffat by Mr. P. Gray; and abundantly on the hills dividing Dumfries and Peeblesshire by Mr. W. Stevens. In Perthshire Dr. Balfour has found it near Crieff on Ben Chonzie, and Mr. J. Backhouse on Ben Lawers. In Forfarshire Mr. W. Wilson and Mr. J. Backhouse have seen it on the Clova Mountains, at Glen Fiadh, and in Morayshire Mr. S. F. Gray has found it at Forres.

Abroad this Fern is abundant in Northern Europe. Occurring in Iceland, Lapland, Sweden, Norway, Denmark, Russia, (Nova Zembla, Caucasus, and the Crimea,) Spain, Italy, France, Germany, Switzerland, Hungary, Siberia, Kamtschatka, Arctic America, Canada, United States, and in the Rocky Mountains.

The fronds are lanceolate, oblong in form, pinnate, thinly scaly. Pinnæ oblong, obtuse, and profoundly pinnatifid; lobes oblong.

Caudex brief and tufted.

Stipes brownish. Length from one to two inches.

Fronds from two to six inches in length, and of a dull green colour. Pinnæ more distant below and spreading.

Sori copious, and situated below the apex of the venules. Circular.

The peculiarity of this genus consists in the small concave scale which rests on the vein below the sorus, having a fringed margin spreading over the spore-cases.

This rare Fern grows in the crevices of moist rocks in mountains, at an altitude of twelve hundred to two thousand feet.

There are no varieties.

GENUS XV.

TRICHOMANES. LINNÆUS.

ALTHOUGH this genus is represented in Great Britain by a solitary species, Sir W. J. Hooker has described no less than eighty-seven species in his "Species Filicum," and of these thirteen are found in Jamaica, eleven in Java, eight in Guinea, seven in Brazil, five in Bourbon, five in the Mauritius, five in New Zealand, four in Madagascar, and four in Peru, and the remaining twenty-five are one or more of them to be met with in Ceylon, Mexico, Nepal, Cayenne, Orinoco, Chilæ, Sierra Leone, Barbadoes, West Africa, East Indies, West Indies, Onalau, British Guiana, or the Islands of Falkland, Luzon, Juan Fernandez, Sandwich, Philippine, Pacific, or Seychelles.

This genus is widely spread over the warmer regions of the world.

Trichomanes is closely allied to *Hymenophyllum*, yet easily recognised from that genus. The distinguishing feature in *Trichomanes* is the peculiar entire urn-like cup in which the spore-cases are developed; whilst in *Hymenophyllum* this is split down to the base into two divisions.





Fig. 858.—Portion of fertile frond, under side.

TRICHOMANES RADICANS.

SWARTZ.

The Bristle Fern.

PLATE LXXI.

<i>Trichomanes radicans</i> ,	SWARTZ. WILLDENOW. BABINGTON.
“ “	DEAKIN. HOOKER AND ARNOTT. MOORE.
“ “	KLOTZSCH. NEWMAN. SOWERBY. PRESL.
“ “	BENTHAM. SPRENGEL. NYMAN. E. J. LOWE.
“ <i>ambiguum</i> ,	SIEBER.
“ <i>Europæum</i> ,	SMITH.
“ <i>Hibernicum</i> ,	SPRENGEL.
“ <i>brevisetum</i> ,	R. BROWN. SMITH. PRESL. MACKAY.
“ <i>alatum</i> ,	R. BROWN. HOOKER, (<i>not of</i> SWARTZ.)
“ <i>speciosum</i> ,	WILLDENOW. SPRENGEL. PRESL.
“ “	NEWMAN.
“ <i>pyxidiferum</i> ,	HUDSON. BOLTON, (<i>not of</i> LINNEUS.)
“ <i>anceps</i> ,	WALLICH, (<i>not of</i> HOOKER)
“ <i>scandens</i> ,	HEDWIG. RADDI. MARTENS & GALLEOTTI.
“ <i>umbrosum</i> ,	WALLICH.
“ <i>diaphanum</i> ,	HUMBOLDT. BONPLAND. KUNTH.
“ <i>Andrewsii</i> , (var.	
<i>Andrewsii</i> .)	NEWMAN.
<i>Didymoglossum alatum</i> ,	DESAUX.
<i>Hymenophyllum alatum</i> ,	SMITH. WILLDENOW, (<i>not of</i> SCHKUHR.)
“ <i>Tunbridgense</i> ,	
var.,	SMITH.
“ <i>rupestre</i> ,	RADDI.

Trichomanes—From *thrix*—hair, and *manos*—soft, from the delicate fronds. *Radicans*—Rooting.

A RARE British Fern, which formerly grew near Bingley, in Yorkshire, as in 1758 Bolton saw it there in abundance, and in 1782 he could only find one root. It has been found in Ireland in County Wicklow, in Hermitage Glen by Dr. Mackay, and Powerscourt Waterfall by Dr. Stokes; in County Cork, at Glendine, by Mr. R. Ball; Glanbour by Mr. J. A. Fisher; Temple Michael Glen by Mr. D. Murray; Ballinhasy Glen and Bandon by Mr. S. P. Woodward; Fall of the Clashgariffe by Mr. J. Drummond; near Glandore by Dr. Allman; near Bantry by Professor C. C. Babington; from one thousand to twelve hundred feet on Carrigeena, Kildorrery, by Mr. J. Carrol; in County Waterford, in the Valley of the Blackwater, by Dr. Kinahan; in County Limerick, Cumailte Mountains, by Dr. Mackay; in County Kerry, Tore Mountain, Killarney, by Dr. Mackay; Island of Valentia by Miss H. Blackburne; Cromagaun Mountain by Mr. W. Cristy; Mount Eagle by Mr. D. Moore; Gortagaree by Dr. Taylor; Blackstones, Glouin, Carach, and Inveragh by Mr. W. Andrews; Curaan Lake, Waterville, by Professor C. C. Babington; and in several other localities not made public.

It has been found growing luxuriantly in some abundance in several places, extending over several miles in Wales, but the localities have been kept secret; indeed it has been found necessary to refrain from making the habitats known, from a dread of its extermination by collectors, as has already been the case in some localities; this Fern fetching a high price, and therefore being much sought after, is an inducement to uproot it wherever found.

Abroad it is a native of Spain, of Teneriffe, the Canary Isles, Madeira, and the Azores, India, Jamaica, Martinique, Mexico, Panama, New Grenada, Brazil, Venezuela, in the Galapagos and Society Isles, and Sandwich Islands.

Fronds six to sixteen inches in length, of which the stipes is from a third to a half of this length, membranaceous, pellucid, smooth, and dark olive green. Ovate-triangular, the apex somewhat attenuate. Tripinnatifid. The pinnæ ovate-lanceolate, with oblong segments, dentate; the teeth being brief and linear.

Stipes above having a narrow membranaceous margin or wing. Rachis margined throughout with this membranaceous wing.

Veins branched, in the sterile fronds terminating within the margin, and in fertile fronds continued beyond the margin, and forming the receptacle.

Fructification extra-marginal. Involucre cup-shaped.

The sterile fronds will remain on the plant, if uninjured, for a number of years, and the fertile fronds require several years to arrive at maturity.

I have large plants growing in great luxuriance, which are grown in large pans filled above the drainage with lumps of freestone, amongst which is a compost of lumps of peat and a moderate sprinkling of silver-sand; when planted the rhizomas were pegged tightly to the peat and stones. These pans were elevated in larger pans filled with water, which made a canal of water round the plants, and the whole placed in square glass frames, having a glass lid to open in order to water, which is thrown on the fronds in a small shower every morning. This glass frame is a great advantage over the bell-glass, as the fronds remain untouched. The plants are grown in a shady portion of a greenhouse.

There are several varieties:—



Fig. 859.

ANDREWSII, *Moore*. (Fig. 859.)—Found in Glouin Caragh, Ireland, by Mr. W. Andrews. This variety differs from the normal form in having narrower, more lanceolate fronds, in the pinnae being more distant and distinct, the involucre

quite sunk in the margin of the frond, instead of being almost stalked as in the normal form. The stipes is also more elongated and less marginal winged.

DILATATUM, *Backhouse*.—A form resembling the *Hymenophyllum dilatatum* which Messrs. Backhouse, of York, have procured from Ireland, having large very dark green fronds, with much less divided pinnules, which are broadly winged. I am indebted to Messrs. Backhouse for a plant.

ALATUM, *Backhouse*.—A conspicuously-winged variety, found in Ireland. I have not seen fronds of this Fern.

FURCANS, *Lowe*. (Plate LXXII.—A.)—Found in Ireland. Differing merely in being branched. As yet it is uncertain whether it will be a permanent variety.

GENUS XVI.

HYMENOPHYLLUM. SMITH.

SCARCELY differing from *Trichomanes*, the mark of distinction consisting in the involucre being two-valved.

There are two British species; and eighty-five known species are described by Sir W. J. Hooker in his "Species Filicum;" of these ten are natives of New Zealand, nine of Jamaica, nine of Chilæ, seven of Java, five of Mauritius, four of Brazil, three of Columbia, three of Peru, three of Caraccas, and three of Nepal.





Fig. 860.—Portion of pinna, magnified.

HYMENOPHYLLUM TUNBRIDGENSE.

SMITH.

The Tunbridge Film Fern.

PLATE LXXII.—B.

<i>Hymenophyllum Tunbridgense.</i>	SMITH. HOOKER AND ARNOTT.
“ “	BABINGTON. MACKAY. DEAKIN.
“ “	NEWMAN. MOORE. SOWERBY.
“ “	BENTHAM. GRAY. BROWN.
“ “	WILLDENOW. SPRENGEL. PRESL.
“ “	NYMAN. SCHKUHR. E. J. LOWE.
“ <i>asperulum.</i>	KUNZE. PRESL.
“ <i>Thunbergii.</i>	ECKLON. PRESL.
“ <i>minimum.</i>	RICHARD. A. CUNNINGHAM.
“ <i>revolutum.</i>	COLENZO.
“ <i>cupressiforme.</i>	LABILLARDIERE.
<i>Trichomanes pulchellum.</i>	SALISBURY.
“ <i>Tunbridgense.</i>	LINNÆUS. HEDWIG.

Hymenophyllum—From the Greek, *hymenos*, a membrane, and *phyllon*, a leaf. *Tunbridgense*—Tunbridge.

FOUND in mountainous and damp rocky situations, or amongst moss on the ground and the trunks of trees.

This moss-like Fern grows in the counties of Cornwall,

Devon, Somerset, Kent, Sussex, Cheshire, Lancashire, Yorkshire, Cumberland, Westmorland, Glamorgan, Brecknock, Merioneth, Carnarvon, Dumfries, Lanark, Peebles, Argyle, Dumbarton, Galway, Clare, Tipperary, Cork, Waterford, Kerry, and the Islands of Valentia, Mull, Bute, and Arran.

It is also a native of Norway, Sweden, Germany, Italy, France, and Belgium; in India, Madeira, the Azores, Mauritius, Chili, Brazil, New Holland, New Zealand, Tasmania, Valdivia, and the Cape of Good Hope.

Fronds annual, pellucid-membranaceous, smooth. Length from one to six inches, colour olive green. More or less lanceolate-ovate in form, and pinnate below.

Pinnæ alternate and decurrent, and furcately-bipinnatifid. Segments linear, obtuse, and serrated.

Veins dichotomously branching.

Fructification extra-marginal. Receptacle oblong-clavate, free, and central. Involucres two-valved, semi-orbicular, sessile, and erect, the upper margin spinuously serrated.

Stipes slender and wiry, rachis winged, caudex filiform, creeping, densely branching.

Found from the sea level to the height of twelve hundred feet, and delighting to grow in a warm, damp, sheltered situation.

Under cultivation the same treatment adopted with *Trichomanes radicans* will suit this Fern, and it succeeds best when planted in a pan at an inclination of forty-five degrees, and kept constantly moist.

There are no varieties.



Adiantum punctatum L.

LXXIII



Fig. 861.—Portion of pinna, magnified.

HYMENOPHYLLUM UNILATERALE.

BORY.

Wilson's Film Fern.

PLATE LXXIII.

<i>Hymenophyllum unilaterale</i> ,	BORY. WILLDENOW. NEWMAN.
“ “	MOORE. SOWERBY. SPRENGEL.
“ “	PRESL. HOOKER. E. J. LOWE.
“ <i>Wilsoni</i> ,	HOOKER AND ARNOTT. WILSON.
“ “	MACKAY. BABINGTON. DEAKIN.
“ “	PRESL. NYMAN.
“ <i>Tunbridgense</i> ,	SCHKUHR. KUNZE. BENTHAM.
“ <i>peltatum</i> ,	DESVAUX.
“ <i>Meyeri</i> ,	PRESL.
“ <i>Menziesii</i> ,	PRESL.
<i>Trichomanes Tunbridgense</i> ,	LIGHTFOOT. BOLTON.
“ <i>peltatum</i> ,	POIRET.

Hymenophyllum—From the Greek, *hymenos*, a membrane, and *phyllon*, a leaf.

Unilaterale—One-sided.

A MORE common species than *H. Tunbridgense*, and found in the counties of Cornwall, Devon, Stafford, Salop, Lancashire, York, Northumberland, Westmorland, Cumberland, Glamorgan,

Brecknock, Cardigan, Carmarthen, Montgomery, Merioneth, Carnarvon, Dumfries, Kircudbright, Ayr, Renfrew, Peebles, Stirling, Forfar, Clackmannan, Perth, Argyle, Dumbarton, Ross, Sutherland, Tyrone, Antrim, Londonderry, Donegal, Down, Fermanagh, Galway, Mayo, Dublin, Wicklow, Tipperary, Kerry, Islands of Mull, Arran, Shetland, Orkney, Langa, and Harris.

Found also in the Faroe Islands, Norway, Bourbon, Tierra del Fuego, Cape Horn, Falkland Islands, Tasmania, New Zealand, Cape of Good Hope, Chilæ, and Hermite Island.

Fronds pellucid-membranaceous, smooth, length from one to six inches, colour dark olive brown, elongate-oblong, and pinnate. Pinnæ distinct below, and decurrent and narrowly-winged above, curved backwards, sub-unilateral, and several times dichotomously forked; the fronds sometimes branched.

Segments linear, obtuse, and spinulosely serrated.

Stipes slender, one third the length of the frond. Rachis narrowly-winged above.

Veins several times dichotomously branched.

Fructification extra-marginal. Receptacles free, central, oblong club-shaped, and shorter than the valves of the involucre. Involucres stalked, two-valved, convex, and quite even and entire on the margins.

The fronds endure for several years and renew their growth annually, a circumstance pointed out by Mr. F. Clowes, of Windermere.

There are no varieties.

GENUS XVII.

OSMUNDA. LINNÆUS.

A SMALL family inhabiting the temperate regions of the world, and represented by a solitary English species.

The fructification is more or less inflorescent, hence the name Flowering Fern.



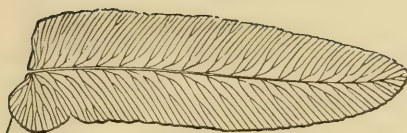


Fig. 862.—Pinnule of mature frond, upper side.

OSMUNDA REGALIS.

LINNÆUS.

The Royal Fern.

PLATE LXXIV.

<i>Osmunda regalis</i> ,	LINNÆUS. BOLTON. SMITH. GRAY.
“ “	HOOKE AND ARNOTT. MACKAY.
“ “	MOORE. NEWMAN. BABINGTON.
“ “	DEAKIN. SOWERBY. BENTHAM.
“ “	SCHKUHR. SWARTZ. WILLDENOW.
“ “	SPRENGEL. PRESL. NYMAN.
“ “	LEDEBOUR. FRIES. KOCH.
“ “	STURM. E. J. LOWE.
<i>Aphyllocalpa regalis</i> ,	CAVANILLES.
<i>Struthiopteris regalis</i> ,	BERNHARDI.

Osmunda—Said to be in commemoration of Osmund, a waterman of Loch Tyne, who is related to have hid his wife and daughter on an island lake covered with this Fern. *Regalis*—Royal.

THIS most interesting and majestic species grows usually at or near the sea-level, and is seldom found exceeding three hundred feet in elevation.

It is a native of the counties of Cornwall, Devon, Hants, Dorset, Wilts, Sussex, Middlesex, Surrey, Bucks, Essex, Suffolk,

Norfolk, Cambridge, Warwick, Monmouth, Hereford, Worcester, Salop, Nottingham, (now, I fear, extinct,) Cheshire, Lancaster, York, Durham, Northumberland, Westmorland, Cumberland, Glamorgan, Pembroke, Merioneth, Flint, Carnarvon, Isles of Anglesea, Purbeck, and Wight. In Scotland in Dumfries, Kircudbright, Lanark, Kincardine, Perth, Forfar, Aberdeen, Argyle, Dumbarton, Sutherland, Islands of Arran, Bute, Mull, Islay, Uist, Harris, Lewis, and Shetland. In Ireland, Donegal, Galway, Dublin, King's County, Wicklow, Cork, Kerry, Waterford, Clare. Also in Jersey.

Abroad a native of Denmark, Russia, Sweden, Gothland, Holland, France, Italy, Switzerland, Spain, Belgium, Germany, Hungary, Portugal, Turkey, Croatia, Transylvania, India, Azores, Algeria, Natal, Madagascar, Newfoundland, Canada, United States, Mexico, and Brazil.

This Fern grows erect and trunk-like, with a stipes half the length of the frond, smooth and pale green (except when young.)

Fronds more or less erect, varying in length from two to twelve feet, and bright yellow green in colour; membranaceous. Bipinnate to tripinnate, broadly lanceolate in form. The fronds are part sterile, and part have a terminal fertile panicle. Sterile pinnæ sub-opposite, ovate-lanceolate, and distant. Pinnules from an inch to two inches and a half long, sessile, oblong-ovate, with a somewhat widened base, occasionally auricled or deeply lobed.

Veins forked near the base.

Fructification. The whole or a portion of the upper pinnæ transformed into a bipinnate, contracted, inflorescent panicle. Spore-cases crowded on the margin.

At Santander, in the north of Spain, in 1860, I saw numerous dwarf plants in the crevices of low rocks by the sea side, where they would be frequently washed by sea waves.

A dozen years ago three plants alone remained in the fields of Mr. C. Allcock, at Bulwell, Nottinghamshire. They were evidently dying from being too dry, as the land had been drained. I brought one to Highfield House, and it has become a large plant bearing fronds six feet in length. The others, in their native habitat, lingered for a couple of years and then died.

It would be a difficult matter to find a more graceful and elegant plant than the *Osmunda regalis* when grown on the

banks of a lake or stream of water. Though easily cultivated it is several years before it recovers itself after being transplanted.

There are a few varieties:—



Fig. 863.

CRISTATA, Moore. (Fig. 863.)—A remarkably handsome form, which accidentally came into the possession of Messrs. Osborn and Sons, of Fulham, and by them distributed. Length three feet, width two feet, broadly ovate in form, bipinnate, the rachis being furcate, and the apex multifid crisped. The apices of the pinnæ dilated into a large, spreading, crispy, fan-shaped tuft, and the apices of the pinnules also dilated and multifidly lobed. My thanks are due to Messrs. Osborn for a plant presented to me several years ago, and which has flourished with me to such an extent, that, at the British Association Floral Fete, in August, 1866, it won the first prize as a specimen British Fern, being symmetrical in form, and fourteen feet in circumference.

INTERRUPTA, Moore.—In the possession of Mr. Sim, of Foot's Cray. Differing in having a few normal pinnæ, and the rest reduced in size, and of a roundish flabellate form.

BULBIFERA, Lowe.—The exact counterpart of *cristata*, raised from spores by Mr. Clift, of Birmingham, and merely differing in having a bulbil at the base of the pinnæ. My thanks are due to Mr. Clift for a plant.

GENUS XVIII.

OPHIOGLOSSUM. LINNÆUS.

A GENUS closely approaching *Botrychium*, and like that Fern very difficult to cultivate.

There are two British species.





A



B

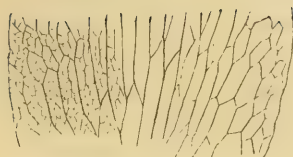


Fig. 864.—Portion of barren frond.

OPHIOGLOSSUM VULGATUM.

LINNÆUS.

The Common Adder's Tongue.

PLATE LXXV.—A.

<i>Ophioglossum vulgatum</i> ,	LINNÆUS. BOLTON. SMITH. MACKAY.
“ “	HOOKE AND ARNOTT. BABINGTON.
“ “	NEWMAN. DEAKIN. MOORE. GRAY.
“ “	SOWERBY. BENTHAM. SWARTZ. KOCH.
“ “	SCHKUHR. SPRENGEL. WILLDENOW.
“ “	PRESL. NYMAN. STURM. LEDEBOUR.
“ “	METTENIUS. E. J. LOWE.
“ <i>ovatum</i> ,	SALISBURY.
“ <i>Riehlîi</i> ,	PRESL.
“ <i>unifolium</i> ,	GILIBERT.
“ <i>Grayi</i> ,	BECK.
“ <i>microstichum</i> ,	ACHARIUS. SVENSK.

Ophioglossum—From *ophios*—a serpent, and *glossa*—a tongue, hence its name. *Vulgatum*—Common.

THIS diminutive inconspicuous Fern is a widely-dispersed British Fern, occurring in moist loamy meadows from the sea-level to six hundred feet elevation.

Dispersed throughout Europe, and occurring in North

America, Mexico, New Zealand, New Holland, Cape of Good Hope, in the Caucasus, East Indies, Siberia, and in Kamtschatka.

Fronds three to twelve inches in length, thin and fleshy. Sterile frond smooth, sessile, entire, ovate-elongate, and yellowish green in colour. Fertile frond—a single spike terminating an elongate footstalk. Spike linear.

Veins anastomosing without a midvein.

MICROSTICHUM, *Moore*.—Found at Swanbister, in the Island of Orkney, by Mr. J. T. Syme. Much smaller, narrower, and the frond becoming mature in September, at a time when the normal form has died away.

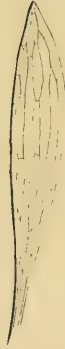


Fig. 865.—Barren frond, upper side, (slightly magnified.)

OPHIOGLOSSUM LUSITANICUM.

LINNÆUS.

The Dwarf Adder's Tongue.

PLATE LXXV.—B.

<i>Ophioglossum lusitanicum</i> ,	LINNÆUS. MOORE. NEWMAN.
“ “	SOWERBY. BABINGTON. PRESL.
“ “	SWARTZ. WILLDENOW.
“ “	SPRENGEL. LINDLEY. NYMAN.
“ “	HOOKE AND GREVILLE.
“ “	E. J. LOWE.
“ <i>angustifolium minimum</i> ,	BARRELIER.
“ <i>vulgatum</i> var. <i>lusitanum</i> ,	HOOKE AND ARNOTT.

Ophioglossum—From *ophios*—a serpent, and *glossa*—a tongue, hence its name. *Lusitanicum*—Lusitania.

A DIMINUTIVE species, discovered in 1854 in Guernsey by Mr. G. Wolsey.

The fronds do not arrive at maturity till October.

Not as yet found in England, Scotland, Ireland, or Wales.

A native of France, Italy, Greece, Spain, Portugal, Sicily, Dalmatia, Tangiers, Algiers, Madeira, Teneriffe, the Canary Isles, Azores, Cape de Verd Isles, Swan River, New Zealand, Tasmania, and St. Helena.

A most difficult Fern to cultivate; found wild, growing on the summit of rocks among short grass.

Fronds two inches in height, thick, and fleshy, pale green in colour. Sterile fronds linear-lanceolate, smooth, and tapering into the stipes. Fertile frond longer, the spike linear-oblong, half an inch long, wider above the base, and having on each margin from three to six spore-cases.

Veins anastomosing, without a midvein.

Stipes erect, and from a third to half the length of the frond.

There are no varieties.

GENUS XIX.

BOTRYCHIUM. SWARTZ.

A SINGULAR family, with herbaceous, dwarf, non-fern-like fronds.

Only one British species.



A



E



Fig. 866.—Portion of barren frond.

BOTRYCHIUM LUNARIA.

SWARTZ.

The Common Moonwort.

PLATE LXXVI.—A.

<i>Botrychium lunaria</i> ,	SWARTZ. SMITH. MACKAY. MOORE.
“ “	HOOKE AND ARNOTT. BABINGTON.
“ “	DEAKIN. NEWMAN. WILLDENOW.
“ “	KINAHAN. SOWERBY. BENTHAM.
“ “	SCHKUHR. SPRENGEL. PRESL. KOCH.
“ “	NYMAN. LEDEBOUR. MILDE.
“ “	E. J. LOWE.
“ <i>lunatum</i> ,	GRAY.
<i>Botrypus lunaria</i> ,	RICHARD.
<i>Osmunda lunaria</i> ,	LINNÆUS. BOLTON. SMITH. STURM.
“ “	ROTH.
“ <i>lunata</i> ,	SALISBURY.
<i>Ophioglossum pennatum</i> ,	LAMARCK.
<i>Botrychium rutaceum</i> ,	SWARTZ. WILLDENOW. SCHKUHR.
“ “	PRESL. NEWMAN. BABINGTON.
“ “	LEDEBOUR.
“ <i>lanceolatum</i> ,	RUPRECHT.
“ <i>matricariæfolium</i> ,	BRAUN. WOODS. MILDE.

Botrychium—From *botrys*—a cluster of grapes.

Lunaria—The Moon.

A COMMON yet local species, growing in dry exposed pastures from the sea-level to an altitude of three thousand feet.

A native of most parts of Europe. Found in Siberia, Sikkim, Kamtschatka, Newfoundland, Greenland, Bear Lake, Behring's Straits, Fuegia, Tasmania, Victoria; the Himalaya, Ural, Altai, and Rocky Mountains.

Difficult to cultivate, and requiring to be transplanted in the grass sod in which it is found, as the grass seems to be essential to its existence.

Length of frond from two to ten inches, stout and fleshy.

Sterile fronds smooth, dark green, pinnate, with from four to seven somewhat lunate pinnæ.

Fertile frond narrow, rachiform spikelets flattened, and being on the inner side, a double row of erect grape-like spore-cases.

The fronds spring up in April, and die away in July.

There are a few varieties:—

RUTACEUM, Moore.—Differs in having a broad triangular twice-divided sterile frond, and in the three to four pairs of secondary divisions being narrow-oblong. Found at Barry, near Dundee.

TRIPARTITUM, Moore.—Found by the late Dr. Kinahan on Kilmashogue Hill, in the county of Dublin. Fronds deltoid, differing from the normal form in having a three-parted instead of a single axis, each frond resembling three normal fronds.

INCISUM, Milde, (Moorei, Lowe.) (Plate LXXVI—B.)—Found at Halifax by Mr. Bolton; Crosby Ravensworth, Westmorland, by the late Mr. Clarke; Kilnasanton, Dublin, by Dr. Kinahan. Differing in having the pinnæ deeply incised, and so cutting the margins into narrow segments.

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CONTRIBUTORS TO VOL. II.

IN concluding this Second Volume of "Our Native Ferns," I beg to express my warmest thanks to those friends on this long list for their valuable assistance, and in doing this I cannot refrain from specially thanking Mr. Clapham, of Scarborough; Mr. Barnes, of Milnthorpe; Mr. Clowes, of Windermere; Mr. Elworthy, of Nettlecombe; Mr. James, of Vauvert; Mr. Thomas Moore, of Chelsea; Mr. Monkman, of Malton; the Rev. Charles Padley, of Beaconfield; Messrs. Stansfield, of Todmorden; Mrs. Thompson, of Exeter; Mr. Wollaston, of Chiselhurst; Mr. Clift, of Birmingham; Mr. Willison, of Whitby; Mr. Edwards, of Nuthall; Mrs. Hone, of Vevay; and Mr. Ivery, of Dorking; each have been in constant correspondence with me, and their ready assistance at all times has been a source of great gratification, as well as materially increasing the value of this history of the varieties of "Our Native Ferns." Nor must I omit to thank the following contributors for their valuable co-operation:—

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 Pinder, Rev. G
 Pearson, R. J
 Plukenet
 Postgate
 Preston, R
 Pollini
 Power, Dr
 Pæppig
 Presl
 Pritchard, T
 Poirot
 Rawson
 Ravenshaw, Rev. T. F
 Ray
 Retzius
 Redhead, R. M
 Rooper, Rev. T
 Rogers, Mrs
 Richard
 Riley, Mrs
 Roxburgh
 Roth
 Ruprecht
 Rutson
 Rylands, T. G
 Sadler, J
 Salisbury
 Schott
 Schrader
 Schumacher
 Schreber
 Schultz
 Schlechtendal
 Schlotz
 Schkuhr
 Schlater, J. H
 Scott, C
 Scopoli
 Sibthorp
 Sidebotham, J
 Sim, R
 Shepherd, A
 Sieber
 Smith
 Smith, C
 Smith, Rev. R. T

Smith, Dr
 Smith, J
 Solander
 Sowerby
 Sprengel
 Swartz
 Stansfield, A
 Stansfield, T
 Stowe, A
 Stevens, W
 Sturm
 Stokes, Dr
 Symons, F
 Staley, T
 Stempel
 Syme, J. T
 Svensk
 Stabler, G
 Taylor, Rev. R
 Tatham, J
 Tausch
 Tait, A
 Taylor, A. B
 Taylor, Dr
 Tenore
 Thunberg
 Tinco
 Thompson, Mrs
 Thompson, George
 Thomas, T. H
 Townsend, Miss
 Trevelyan, Sir W. C
 Vernon, Miss
 Viviani
 Villars
 Wahlenberg
 Walker, Mrs
 Ward, N. B
 Wager, G
 Wallich, Dr
 Wallroth
 Westcott
 Weber
 Willeke, T
 Williams
 Weis
 Weinm
 Willison, W
 Wierzb
 Winnm
 Wilson, F. C
 Wilson, W
 Withering
 Wright, Miss
 Wulfen
 Wrigley, Dr. E. G
 Wood, J
 Woodward, S. P
 Woods, J
 Wright, F
 Wilkinson, Miss Isabella
 Willdenow
 Wollaston, G. B
 Wolsey, G
 Young
 Young, J
 Zenker

CORRIGENDA.

[It has been thought desirable to alter the various authors names of the following, as they do not agree in gender with the species.]

VOL. I.

- Pages 264, 280, 282, 339, for 'biformis,' read 'biforme.'
" 264, 282, 341, for 'triangularis,' read 'triangulare.'
" 271, 280, 282, 339, for 'atro-viridis,' read 'atro-viride.'
" 274, 280, 282, 341, for 'multiformis,' read 'multiforme.'
" 278, 280, 282, 341, for 'tenuiformis,' read 'tenuiforme.'
" 280, 316, 324, for 'gracilis,' read 'gracile.'
" 309, 324, 339, for 'irregularis,' read 'irregulare.'
" 312, 324, 339, for 'dilaceratum,' read 'dilacerata.'
" 323, 324, 339, for 'inæqualis,' read 'inæquale.'

VOL. II.

- Page 15, for 'cristata-polydactyla,' read 'cristato-polydactylum.'
" 48, for 'erosa-decurrens,' read 'eroso-decurrens.'
" 77, for 'multicuspis,' read 'multicuspe.'
Pages 105, 148, 482, for 'Vernoniæ-cristata,' read 'Vernoniæ-cristatum.'
" 179, 184, for 'leptorachis,' read 'leptorache.'
" 238, 366, 487, for 'polycuspis,' read 'polycuspe.'
" 297, 367, 488, for 'sagittato-polycuspis,' read 'sagittato-polycuspe.'
" 308, 366, 487, for 'polycuspis-undosum,' read 'polycuspe-undosum.'
" 313, 366, 487, for 'polycuspis-angustum,' read 'polycuspe-angustum.'
" 342, 366, 487, for 'polycuspis-transversum,' read 'polycuspe-transversum.'
" 363, 366, for 'polycuspis-irregulare,' read 'polycuspe-irregulare.'
Page 382, for 'crispum-erectum,' read 'crispa-erecta.'
" 434, for 'quadratum' and 'pulcherrimum,' read 'quadrata' and 'pulcherrima.'

ERRATA.

VOL. I.

- Page 78, for 'tripinnatum,' read 'achurodes.'
" 250, for 'Marsdenæ,' read 'Marsdeniæ.'
" 251, for 'Beevoriæ' and 'Miss Beevor,' read 'Beeveriæ' and 'Miss Beever.'
" 290, for 'vallida,' read 'valida'

VOL. II.

- Page 269, for 'sagittato-cristatum, Clapham,' read 'sagittato-cristatum-Hillmanii, Lowe,' and omit the 'Raincliff Wood locality,' and the expression 'somewhat inconstant.'
" 394, for 'serrulata, fig 806,' read 'fig. 823.'
" 394, for 'projecto-multifida, fig. 807,' read 'figs. 806 and 807.'
" 402, for 'Blechnum,' read 'Lomaria.'



